

The Complexity of Voice Effects on Attitudes towards the New Zealand Police: A Matter of Experience

A thesis
submitted in partial fulfilment
of the requirements for the Degree
of
Master of Linguistics
Department of Linguistics, University of Canterbury 2018
by
Chloe Hobbs

Table of Contents

List of tables	6
List of figures	7
Acknowledgements	9
Abstract	10
Abbreviations	11
1 Aims	12
2 Order of Thesis	13
3 Literature review	16
3.1 Measuring public trust and confidence in the Police	16
3.2 Ethnicity and attitudes towards the Police	18
3.3 The concept of Voice Activation	20
3.3.1 Defining voice activation in context	20
3.3.2 Building upon MacFarlane (2014)	21
3.3.3 Comparing stereotype activation from voice to text	23
3.4 Predicting Voice Activation	23
3.4.1 Familiarity and relevance	23
3.4.2 Perception of ethnicity from linguistic cues	26
3.4.3 Association between the stimuli, the target attitude and the listener	28
3.5 Attitudes and inter-ethnic group behaviour	31
3.6 Attitudes and intra-ethnic group behaviour	33
3.7 Priming and Attitudes towards the Police: Summary of research questions and hypotheses	34
Research Question One: Is a person's level of measurable support towards the Police susceptible to the influence of voice in general?	35
Research Question Two: Does the perceived ethnicity of voice prime attitudes towards the Police and, if so, does this suggest a semantic association between Māori and the Police?	35
Research Question Three: How important is voice as a predictor in relation to other predictors known to influence attitudes towards the Police, namely their prior experience with the Police and ethnic identity?	37

Research Question Four: Are there any (further) identifiable aspects of voice that predict opinions towards the Police?	38
4 Methodology	39
4.1 Factorial design	39
4.2 Survey structure and respondent recruitment	39
4.3 Perception of the speaker's ethnicity and gender: The scenario test	40
4.4 Measurements of attitudes from statements	41
4.5 Respondent demographics	42
4.6 Controlling for voice attributes	44
4.7 Principle Component Analysis	44
4.8 Statistical methodology	45
4.9 Attitude and variables: a summary	49
5 Results	51
5.1 Participant distribution	51
5.2 Perceiving ethnicity from voice	53
5.3 Predicting general agreement	54
5.4 Overall Comparison with the Citizen Satisfaction Survey (2017)	57
5.5 Baseline trust and fairness overview	57
5.6 Baseline trust and fairness visualisation by ethnicity	58
5.7 Baseline trust and fairness: Visualising priming	60
5.8 Baseline trust and fairness: Random forest and variable importance	63
5.9 Baseline Trust and fairness: Linear regression models	65
5.10 Voice activation and the Procedural Justice framework	67
5.11 Visualising the overall effect of voice on attitudes	69
.....	71
5.12 Ethnicity priming visualisation	72
5.13 Trust and fairness: Random forest and variable importance	75
5.14 Trust and fairness: Linear regression models	77
5.17 Voice activation and the importance of prior Police contact	80

5.18	Dissatisfied respondents: Random forests	82
5.19	Dissatisfied respondents: Linear regression models	83
5.21	Satisfied respondents and those with no recent police contact	88
6	Discussion and Implications for Police Research	93
6.1	Research Question One: Is a person's level of measurable support towards the Police susceptible to the influence of voice in general?	93
6.2	Research Question Two: Does the perceived ethnicity of voice prime attitudes towards the Police and, if so, does this suggest a semantic association between Māori and the Police?	94
6.3	Research Question Three: How important is voice as a predictor in relation to other predictors known to influence attitudes towards the Police, namely their prior experience with the Police and ethnic identity?	96
6.4	Research Question Four: Are there any (further) identifiable aspects of voice that predict opinions towards the Police?	100
6.5	Recommendations	101
7	Limitations	103
7.1	Survey methodology	103
7.2	Measurement of latent variables: trust and fairness	103
7.3	Assumptions of non-collinearity	104
7.4	Statement framing and respondent's strength of opinion	105
7.5	Available data sample and possible polynomial regression across the Māori Integration Index	105
8	Potential directions for future research	106
8.1	Additional attitude behaviours	106
8.2	Priming cooperative behaviour and respondent judgments of others	106
8.3	Within-participant attitudinal priming	107
8.4	Further exploration on the link between ethnicity and voice activation	107
8.5	Speaker' bias and the effect of ethnicity production in voice	108
9	References	110
10	Appendices	118
10.1	Statistical Model Syntax for overall data	118

10.1.1	Overall Agreement	118
10.1.2	Baseline Trust	118
10.1.3	Baseline Fairness.....	118
10.1.4	Combined Trust.....	118
10.1.5	Institutional Trust.....	119
10.1.6	Motive-based Trust.....	119
10.1.7	Distributional fairness	119
10.2	Statements	119
10.3	Speaker instructions.....	122
10.3.1	Respondent instructions: default page.....	123
10.3.2	Respondent instructions: Couldn't hear audio, assigned to text control	123
10.3.3	Scenario transcripts.....	124
10.3.4	Scenario questions for all conditions	126
10.3.5	Respondent recruitment	128
10.3.6	Respondent information sheet	130
10.3.7	Respondent consent form	131
10.3.8	Respondent debrief	132
10.3.9	Demographic Questionnaire	133
10.3.10	Māori Integration Index – Matrix Adapted from (Szakay, 2007)	137

List of tables

Table 4-1: Summary of Attitude Response Variables, Voice Predictors and Demographic Factors	49
Table 5-1 Respondents by Ethnicity and Survey Condition.....	51
Table 5-2: Descriptive Statistics for Overall Respondent Agreement.....	51
Table 5-3 1. Linear Regression coefficients for overall survey agreement	56
Table 5-4 Summary Comparison with Citizen Satisfaction Report “Trust and Confidence and Police Role” – in % (adapted from Gravitas, 2017, p.	57
Table 5-5 Baseline Fairness Distribution by Recent Police Contact – Comparison with Statistics Adapted from CSS (Gravitas, 2017, p. 58)	58
Table 5-6: Linear Regression Coefficients and Standard Errors for Baseline trust and Baseline fairness	66
Table 5-7 Descriptive statistics for measures of procedural justice.....	67
Table 5-8 Linear Regression Coefficients for Predicting Attitudes in line with the Procedural Justice framework.....	78
Table 5-9 Linear Regression Models Predicting Attitudes for Respondents Dissatisfied with their Prior Police Contact	84
Table 5-10: Linear Regression Coefficients Predicting Combined Trust: Satisfied Respondents.....	89

List of figures

Figure 3.4-1: Conceptual Map on the Likelihood of Voice Activation by Perceived Ethnicity, in Context of Attitudes towards the Police.....	29
Figure 5.1-1: Density Plot of Overall Respondent Agreement to Statements	52
Figure 5.1-2 Density plot of answers per each individual statement, in numeric form	53
Figure 5.2-1 Bar Chart of the Frequency of Correct Ethnicity Perception across Respondent Ethnic Groups.....	54
Figure 5.3-1 Random Forest Variable Importance for Overall Respondent Agreement.....	55
Figure 5.6-1 Boxplot of Levels of Baseline Trust across Respondent Groups, by Island of Residence	59
Figure 5.6-2 Boxplot of Levels of Baseline Fairness across Respondent Groups, by Island of Residence	60
Figure 5.7-1 Boxplot of the Distribution of Baseline Trust Scores across Ethnic Groups, according to the Mode of Stimuli	61
Figure 5.7-2 Boxplot of the Distribution of Baseline Fairness Scores across Ethnic Groups, according to the Mode of Stimuli	61
Figure 5.7-3 Scatterplots of Baseline Trust and Fairness by MII Score, Grouped by Mode of Stimuli	62
Figure 5.7-4 Box plot of Baseline Trust across Perceived Ethnicity Conditions, by Respondent Ethnicity	63
Figure 5.7-5 Box plot of Baseline Fairness across Perceived Ethnicity Conditions, by Respondent Ethnicity.....	63
Figure 5.8-1 Variable Importance as per the Random Forest for Baseline Trust	64
Figure 5.8-2 Variable Importance as per the Random Forest for Baseline Fairness	64
Figure 5.10-1 Density Plots for each Response Variable in Accordance with the Procedural Justice Framework	68
Figure 5.11-1 Levels of motive-based trust across respondent groups by mode of stimuli.....	70
Figure 5.11-2 Levels of institutional-based trust across respondent groups by mode of stimuli	70
Figure 5.11-3 Levels of overall trust across respondent groups by mode of stimuli.....	71
Figure 5.11-4 Level of perceived distributional fairness across respondent groups by mode of stimuli ...	71
Figure 5.11-5 Figure 5.11-6 PCA discrimination component score across respondent groups by mode of stimuli	71
Figure 5.12-1 Boxplot showing Levels of Institutional Trust across Respondent Ethnic Groups, by Perceived Ethnicity of Stimuli.....	72
Figure 5.12-2 Boxplot showing Levels of Motive-base Trust across Respondent Ethnic Groups, by Perceived Ethnicity of Stimuli.....	73
Figure 5.12-3 Boxplot showing Levels of Combined Trust across Respondent Ethnic Groups, by Perceived Ethnicity of Stimuli.....	73

Figure 5.12-4 Boxplot showing Levels of Perceived Distributional Fairness across Respondent Ethnic Groups, by Perceived Ethnicity of Stimuli	73
Figure 5.12-5 Boxplot showing PCA Discrimination Component Scores across Respondent Ethnic Groups, by Perceived Ethnicity of Stimuli	74
Figure 5.13-1 Variable Importance Plot from the Random Forest Predicting Motive-based Trust across All Respondents	75
Figure 5.13-2 Variable Importance Plot from the Random Forest Predicting Institutional Trust across All Respondents	76
Figure 5.13-3 Variable Importance Plot from the Random Forest Predicting Combined Trust across All Respondents	76
Figure 5.13-4 Variable Importance Plot from the Random Forest Predicting Distributional Fairness across All Respondents	77
Figure 5.17-1 Boxplot of Combined Trust in the Police Reported by Respondents across the Two Islands, According to Recent Police Contact	81
Figure 5.17-2 Boxplot of Combined Trust in the Police according to Dissatisfied Respondents' Ethnicity and Perceived Ethnicity of the Speaker	81
Figure 5.18-1 Variable Importance plot of Combined Trust for Dissatisfied Respondents	82
Figure 5.18-2 Variable Importance plot of Institutional Trust for Dissatisfied Respondents	83
Figure 5.18-3 1.1 Variable Importance plot of Distributional Fairness for Dissatisfied Respondents	83
Figure 5.20-1 Linear regression Interaction between Island and Mode of Stimuli in Predicting Trust for Dissatisfied Respondents.....	85
Figure 5.20-2 Linear regression Interaction between MII total and Mode of Stimuli in Predicting Trust for Dissatisfied Respondents.....	86
Figure 5.20-3 Linear regression effect of clarity on dissatisfied respondents' level of institutional trust	87
Figure 5.21-1 Combined Trust Variable Importance Plot for Satisfied Respondents.....	88
Figure 5.22-1 Combined Trust Variable Importance: Respondents with No Recent Police Contact	90
Figure 5.22-2 Variable Importance Predicting Satisfied Respondents' Levels of Perceived Distributional Fairness.....	91
Figure 5.22-3: Variable Importance plot predicting levels of perceived distributional fairness for respondents who had not had recent Police contact	91
Figure 6.3-2 A Loess Smoother Plot on a Potential Interaction between Mode, Island and MII total for Dissatisfied Respondents.....	98
Figure 6.3-3 Boxplot of Trust by Self Reported Ethnicity and Island of Residence across Mode of Stimuli	98
Figure 7.5-1 Comparison between a polynomial and a linear regression on the interaction effect of mode and MII total, in predicting trust for dissatisfied respondents.....	106

Acknowledgements

First and foremost I owe thanks to my senior supervisor Vica Papp without whom this thesis would not have been possible. I never could have imagined that it is possible to learn so much in the space of a year and I am immensely grateful for all skills you have taught me.

Thanks are also due to my secondary supervisor, Jeanette King, whose comments and encouragement were invaluable. I also thank everyone in the department who have been a great support and in particular Esther Peach who not only helped with the recordings but has become a particularly good friend throughout this process. I owe my thanks to everyone who read draft chapters of this thesis and of course my family and friends for their ongoing support.

Abstract

Recent linguistic and psychological research has shown that voice can influence listeners' processing of unrelated stimuli on a semantic level (Hatzidak et al., 2015) and can affect both their implicit and explicit attitudes towards the social membership categories associated with that voice (Pantos, 2014; MacFarlane, 2014). Yet, little is known about the extent to which the audio prime can activate other attitudes that are not directly associated with another semantically. This research takes the first steps towards addressing this gap in the applied context of citizens' level of perceived fairness and trust in the New Zealand Police. Should attitude priming be activated by perceived ethnicity, this could represent a detrimental and negative reinforcement effect in bicultural Police relations with Māori iwi.

Respondents were randomly allocated to one of four voice conditions (in a factorial design of Māori-NZE ethnicity and gender) or to a text control condition, in an online survey distributed across New Zealand, with a total of 367 responses qualifying for analysis. Attitudes of trust and fairness (Tyler, 2001, 2005; Jackson & Bradford, 2010) were measured across scaled responses to statements, taken from the Citizen Satisfaction Survey (CSS) (Gravitas, 2017) and previous Māori-Police relations focus group research (Maxwell & Smith, 1998; Te Whaiti & Roguski, 1998). These groupings were verified by Cronbach's alpha and Principle Component Analysis - with trust representing a more distant response variable to the perceived ethnicity priming stimuli, whilst fairness was assumed to be more semantically associated with the stimuli prime. Two baseline measures of trust and fairness, adapted from the CSS, were also considered. An exploratory analysis was performed as exemplified by Tagliamonte & Baayen, (2012); using two disparate yet complimentary statistical approaches, Random Forest and linear regression modelling, where condition (audio or text), perceived ethnicity and stimuli gender were potential predictors, alongside the respondent demographic variables.

The results indicate that, as with satisfaction surveys across the world, citizens' attitudes towards the Police are heavily dependent upon their previous contact. Yet, opinions are also subject to an overall audio priming effect, with respondents being more likely to report higher levels of trust and perceived fairness in an audio condition than in the text control condition. This has implications for policing research in general, with the recommendation that future surveys observe the mode of questioning (e.g. telephone interview or online survey) as a factor when reporting on trust measures.

Also consistent with the Police literature (c.f. (Alberton & Gorey, 2018; Skogan, 2006), respondents dissatisfied with their recent Police experience, had a larger, more significant and reliable effect than respondents who were satisfied and there was a higher percentage of dissatisfied respondents in this survey than in the CSS. Crucially, both Random Forests and linear models revealed that the priming effect of audio across trust and fairness was most prominent for dissatisfied respondents. The mode of stimuli also interacted with dissatisfied respondents' level of involvement within the Māori community (MII Index: Szakay, 2007), with trust scores increasing alongside the MII score but only in the text condition ($p < 0.05$). Conversely, an increasing MII score independently predicted lower trust scores. The MII measurement was also a significant independent predictor for perceived fairness and thus suggests that a binary classification of Māori-non Māori ethnicity may not be sufficient in New Zealand Police satisfaction research. Finally, the participant's Island location (North or South) was a significant predictor overall for trust and also interacted with the mode of stimuli for dissatisfied respondents, with those in the South Island being significantly ($p < 0.01$) more likely to have more trust in the text condition than those in the North who appeared to trust more in the audio conditions.

Perceived ethnicity of the stimuli was only found to be significant ($p < 0.01$) for dissatisfied respondents in the measure of fairness through the PCA analysis, where those who perceived the ethnicity to be any other than Māori or NZE scored lower in perceived fairness. Thus, this partially supports the hypothesis that priming of the stimuli is more likely when the response is semantically related, whilst the concepts of ethnicity and the Police overall may be too distant for such effects to occur in the broader trust measure. The gender of the stimuli also had a small effect across overall survey agreement but only for those who were victims of crime, with respondents perceiving stimuli the stimuli as female being more likely to agree than those perceiving the stimuli as male. However, given that the linear models revealed significant individual variation across participants and the random forests echoed the overarching weight of police contact on all attitudinal responses, any priming effects associated with voice attributes and social membership can only be taken as tentative findings of a small-scale study.

Abbreviations

The following abbreviations are used consistently throughout this thesis:

CSS: New Zealand Police Citizen Satisfaction Survey (Gravitas, 2016, 2017)

MII: Māori Integration Index (Szakay, 2007)

NZE: New Zealander of European descent (often referred to as Pākehā)

NZ Police: New Zealand Police

PCA: Principle Component Analysis

1 Aims

The primary aim of this thesis is to build upon previous research which has shown the vast array of effects that a voice can have on a listener in any form of interaction. To date, it is known that voice can:

- Contribute to the listener's opinions of the speaker themselves and the social membership groups the listener perceives the speaker to belong to (e.g Szakay, 2007; MacFarlane & Stuart-Smith, 2012; De, 2017)
- Alter the listener's semantic processing ability of emotionally charged content (Hatzidaki, et al., 2015)
- Change the actual phonetic perception of what a speaker hears, as a consequence of the social context (e.g. (Hay et al., 2006; Hay & Drager, 2010)
- Determine the production of sounds in which the listener will respond with in accordance with their evaluation of the social context (e.g. (Benor, 2010; Drager, 2009)

The gap which this thesis aims to address, however, is the extent to which the listener's perception of social membership affiliation from voice can affect their opinion towards a concept that is not directly attributed to this social grouping or necessarily to the speaker themselves. Listeners' perception of speaker ethnicity will be the chosen attribute of voice focused on here and its importance as an attribute in voice activation will be explored by contrasting the overall impact of voice against text. If perceived ethnicity is not found to be important but the overall voice is, this may help to direct the course of future voice activation research.

The secondary yet related aim is to take the first steps towards an exploration of the extent to which voice activation is prominent and consequential within a real-world context. It will do this with the example of citizens' attitudes towards the New Zealand Police, which was chosen because it offers a unique opportunity whereby the stimuli (perceived ethnicity) can be assumed to be relevant to Police attitudes on a gradient scale. It is conceivable that ethnicity is more strongly associated (and more emotionally charged) to an attitude relating to fair treatment of citizens, yet is more distantly related when looking at overall trust measures, where other factors become more prominent. The expansive knowledge that already exists in this field of Police research presents an opportunity to rank any effect of voice alongside the factors that are known to be core predictors of attitude, namely respondents' prior experience with the Police and their self-identified ethnicity.

The implications for research in this area are significant for the New Zealand Police, where trust and confidence are low with the Māori community and where the Police's attempts to rectify this are highly

prominent within the media. Therefore, the scope of this thesis is to focus specifically on perceptions of Māori ethnicity in relation to the majority population: New Zealanders of European descent.

2 Order of Thesis

The premise of this thesis is that a person's level of affiliation within their ethnic group can be made more salient from voice stimuli (both within and between groups) and that this will cause them to activate attitudinal behaviour perceived to be stereotypical within that group. This is a cross-disciplinary assumption, which crosses from speech perception and inferences from linguistic cues to the cognitive process of activating a behavioural response; thus relying upon insights from social psychology as well as linguistic frameworks and background content from the field of Police research.

The first two sections of the literature review provide the contextual background information necessary before the theory of voice activation can be applied. Section 1 details the behavioural response variables that will be measured: levels of trust in and perceived fairness of the Police. It describes these latent concepts from a Procedural Justice framework (Tyler, 2001, 2005; Tyler & Blader, 2000) and reviews the relationship between previous experience with the Police and these attitudes, thus setting the scene for assessing the effect of voice relative to contextual factors. Section 2 then considers the relationship between the respondents' ethnicity and these attitudes and applies this global precedent to the local New Zealand context, discussing current relations between Māori and the Police. The remainder of the literature review consists of four sections, all of which contribute their own yet related hypotheses. They are brought together at the end of the chapter as summarising research questions.

Section 3 is the core chapter on the concept of "voice activation", which is defined in section 3.1 in line with pioneering work from MacFarlane (2014) in the field of social psychology and section 3.2 reviews this work with the intention of drawing upon his recommendations and limitations as a foundation for the current study. Arguably, MacFarlane's most significant contribution to the field of voice activation is that he was the first to use a text condition as a baseline control; the implications of this in context of the current study is the focus of Section 3.3.

Given that MacFarlane (2014) found voice activation was not a consistent phenomenon, Section 4 then brings together the potential factors in the likelihood of a stimulus voice influencing the listeners' attitudinal response. This is a complex task when applied to a real-world context whereby the listener is evaluating a statement that is less directly associated with the voice stimuli and is highly charged by individual experience with the Police (discussed in section 1). Section 4.1 discusses MacFarlane's (2014) concept of stereotype relevance and familiarity, and reviews tools which could measure these latent constructs in the context of Māori ethnicity (Houkamau & Sibley, 2010; Szakay, 2007). Further insights are offered on the effect of familiarity from the wider realm of behavioural priming (Huang et al., 2011; Song & Schwarz, 2008), demonstrating how familiarity facilitates quicker reaction times. Hatzidaki et al.,

(2015) relate this to linguistic behaviour, finding that unfamiliarity with the stimuli can be detrimental to the processing of resource-intensive semantic content. The effect of Police contact is then predicted in relation to the relevance of perceived ethnicity in voice. It is argued, however, that ultimately familiarity will be determined by the respondent's perception of the voice and thus section 4.2 considers how a person becomes familiar with linguistic cues in a voice and then associates that in context with a specific membership category. It reveals how the perception of linguistic cues interacts in a bidirectional relationship with attitudinal judgements (Hay & Drager, 2010; Hay et al., 2006; Levon, 2014). Section 4.3, uses the frameworks of social cognitive linguistics (Croft, 2009) and Communication Accommodation Theory (Giles, 1973) to then tie the associated relationship between individual and social voice activation predictors together.

Sections 5 and 6 review inter and intra ethnic relations from a broader perspective, investigating why some individuals may have more motivation to align themselves with an ethnic group and thus be more susceptible to ethnic voice activation than others. Finally, section 7 serves as the bridge between the theoretical framework and the Police, specifically reviewing the work of both Johnson et al., (2017) a factorial racial priming experiment on attitudes towards the Police, and of Savage (2016) who presents the first analysis of the effect of the interviewers' race on these attitudes.

The methodology chapter then begins with an outline of the 2X2 ethnicity-gender factorial design of the survey that was distributed across New Zealand using the Qualtrics Survey Software platform and details the recruitment procedures of both speakers and survey respondents. The way in which the respondents' perception of ethnicity was measured is discussed in the context of an additional scenario test. The chapter describes how the latent attitudes of trust and fairness were constructed from 20 attitudinal statements, adapted from the New Zealand Police Citizen Satisfaction Survey (CSS) (Gravitas, 2016) and the 1998 focus groups (Maxwell & Smith, 1998; Te Whaiti & Roguski, 1998). Details of the attitude validation measures, including Principle Component Analysis are then provided. In order to compare results to the CSS, baseline measures of trust and fairness were also analysed. Other voice attributes were also controlled for, in order to verify whether the individual voices themselves, instead of their perceived ethnic group, could be responsible for activating an attitudinal response. A discussion on the rationale behind using the two different statistical approaches of Random Forests is then provided; to observe the importance of voice in relation to other factors in activating a response, and regression modelling, which is used to interpret directions of any linear interactions between the predictor variables.

The results chapter then begins with a descriptive summary of the 367 results analysed in this survey and the distribution pattern across each survey shows that survey acquiescence was not an apparent issue. In line with MacFarlane, voice activation from the stimuli gender appears to have a weak effect on overall statement agreement. There is then a comparison of the findings to the CSS (Gravitas, 2017), with a specific focus on the effect of the Māori Integration index scores and features of voice perception on predicting the baseline trust and fairness measures. These factors are then assessed for their importance

on predicting the attitudes devised in accordance to the Procedural Justice framework (Tyler, 2001, 2005). It is evident that the respondents' previous contact with the Police has the greatest effect on their reported attitudes and thus the following section analyses voice activation in accordance to whether or not the respondent has had prior Police contact. The discussion then addresses the four key research questions proposed at the end of the literature review before providing recommendations for Police research. Finally, the limitations of the research are discussed and suggestions for future research, into both voice activation, and attitudes towards the Police are provided.

3 Literature review

Contextual information on the attitudes to be activated by voice

3.1 Measuring public trust and confidence in the Police

If a person's opinion can be altered by their perception of the interlocutor's ethnicity - or any other attributes of their voice for that matter – this would have significant implications for Police across jurisdictions. Not only is public opinion relied upon for a measure of performance but it is also an informant for the distribution of Police resources and contributes to the formation of policing policies. Even for countries whereby governance structures have refocused on fighting crime as the central component, such as the United Kingdom, public opinion is still central to everyday Police operations which demand cooperation (Jackson & Bradford, 2010a). Within New Zealand, obtaining higher levels of public levels of trust and confidence and overall satisfaction of 90%, as measured in the independent annual Citizen Satisfaction Survey (CSS) (Gravitas, 2017) is currently one of the Police's core targets (New Zealand Police, 2017). Yet, up until the last CSS survey, when a paper-based and online version was introduced, public opinion was measured solely via telephone interview (Gravitas, 2017). If the interviewer's voices can influence opinion, the reliability of the results combining both modes of research or comparing previous years to the most current year, would be called into question. In order to address this potential concern, it is first necessary to review what exactly the Police are aiming to measure and what factors are likely to influence this outcome. This is the aim of this first section and section 2, which specifically discusses the importance of ethnicity/race as predictor of opinion.

Within their latest strategic plan, the Police identify three key "customer groups": victims, offenders (focusing on both accountability and rehabilitation) and the wider community (New Zealand Police, 2017, pp. 7–8). As such, they are interested in local-level attitudes arising from prior experience with the Police as well as attitudes at a more global level, whereby the latter attitudes are important for assessing how safe all members of the community perceive themselves to be (New Zealand Police, 2017, p. 8). Typically, survey questions measuring global attitudes refer simply to 'trust' in statements such as "I have trust and confidence in the Police" (as per the CSS, (Gravitas, 2017)). Jackson & Bradford(2010) conceded that responses to a generic statement such as this significantly correlated to specific statements regarding attributes that have previously been found to composite public trust ("effectiveness", "fairness" and "community engagement" (Jackson & Bradford, 2010, p. 245)). However, they also argued (albeit without supporting evidence) that the weightings of each of these components are likely to be highly variable across individuals according to prior experience and social factors and should therefore be analysed if more than high-level detail is required across communities (Jackson & Bradford, 2010, p. 247).

Jackson & Bradford, (2010, pp. 247-248) therefore echoed their support for the widely recognised model of Procedural Justice which has been significantly developed upon by Tyler (2001, 2005; Tyler & Blader, 2000). This framework, which has also been applied to group perceptions towards institutions in a more generic sense, centres around a premise that impartiality, respectfulness and consideration towards the communities' views is more important in predicting citizen's trust than even the perceived effectiveness of the Police at attending to and reducing crime (Jackson & Bradford, 2010; Tyler, 1987, 2001, 2005; Tyler & Blader, 2000). Lowrey-Kinberg (2018) has further shown that this framework reinforces the cruciality of public opinion towards the Police. Within their experiment, procedural justice was manipulated across experimental vignettes by using Communication Accommodation Theory (Giles, 1973) and Politeness Theory (Brown & Levinson, 1989). The "neutral" condition represented "the minimum amount of dialogue required to carry out a speeding stop"; the "procedurally just" condition involved the officer being polite and explaining the rationale behind the stop according to community safety, and the "over-accommodating" condition involved over-politeness and an emphasis on solidarity (Lowrey-Kinberg, 2018, pp. 115-116). Participants were found to rate the Police officer's interaction more highly in the procedurally just condition than the over-accommodating condition (Lowrey-Kinberg, 2018).

Tyler, (2005) further conceptualised procedural justice as two distinctive measures of trust: "Institutional-based trust" and "Motive-based trust". As the name suggests, institutional trust relates to public perception of the institution as a whole, the extent to which it is transparent and also how well it reflects care towards the communities it serves (Tyler, 2005:235). An example of a reverse-scored statement to gauge levels of this type of trust is: "Some of the things the Police do embarrass the city" (Tyler, 2005:329). Motive-based trust, on the other hand, relates to the public's perceptions of Police intentions and often, but not necessarily, reflects behaviour of the individual officer; for example, the Police "give honest explanations for their actions to the people they deal with" (Tyler, 2005, pp. 325-329). For the purposes of this thesis, the most relevant component that stretches across measures of trust is perception of fairness. Distributive fairness (or justice) relates to the Police's responsibility to distribute their services in a fair and active manner across the communities in which they serve (Tyler, 2005, p. 326) and Jackson & Bradford (2010) argue that the public see this as an essential component of the Police's role, to "defend civility" (2010, pp. 247-248). Distributional fairness at the community level has been found to significantly correlate with both institutional (Tyler, 2005) and motive-based trust (Jackson & Bradford, 2010).

The most significant predictor across all measures of trust towards the Police has been found to be respondents' prior experience with the Police (e.g. Alberton & Gorey, 2018; Reynolds et al 2018). Moreover, the negative effect from respondents who were dissatisfied with their prior contact appears to exceed the positive effect of respondents who were satisfied with their recent contact in explaining overall variance, with the asymmetry effect robust across surveys and jurisdictions, regardless of the question framing (Skogan, 2006). The type of contact has also been established as important (e.g. Bradford et al.,

2009) with citizen-initiated contact (i.e. victim and witness) most susceptible to the asymmetry effect (Skogan, 2006). However, in their factorial experiment, Maguire et al., (2017) found that whilst a negative encounter did indeed influence reports of global levels of trust and confidence on an institutional level more than a positive encounter, the likelihood of reported cooperation with an individual police officer was influenced just as strongly when witnessing a procedurally-just encounter as the negative effect of an procedurally unjust encounter (2017, pp. 385-386). This supports findings from Bradford et al., (2009), whereby Londoners who reported positive contact responded with significantly increased perceptions of fairness and community engagement. Given that fairness at the local level also invokes the concept of membership within a social group by relating how the individual perceives they were treated in accordance with other members of their community (Tyler, 2005), an interaction between police contact and ethnicity (both respondent and perceived ethnicity of the stimuli) may thus be more expected to occur when measuring fairness than the global level of trust. The current research will therefore explore and compare the effect of voice across the dimensions of fairness and trust, both motive-related and institutional.

3.2 Ethnicity and attitudes towards the Police

The discussion will now move on to explore the effect of the respondents' ethnicity on attitudes towards the Police and how this can be applied to a New Zealand Aotearoa context. However, to do so, it is first necessary to define what is meant by 'ethnicity'. According to Statistics New Zealand (2018), "Ethnicity is a measure of cultural affiliation. It is not a measure of race, ancestry, nationality, or citizenship. Ethnicity is self-perceived and people can belong to more than one ethnic group. The fact that people can belong to more than one ethnic group is an important point in the New Zealand context. The 2013 Census revealed that nearly half of Māori respondents also identified as New Zealand European (Statistics New Zealand, 2014). Ethnicity is therefore a summarization of various attributes of a person's social identity at any given time, even though it may hold throughout their life. To the lay population, however, ethnicity and biological race are often intertwined concepts, or even the same thing (e.g. Wolfram & Schilling, 2015 and thus it is unlikely that people consider all the components of ethnicity when first encountering the voice of another person, since they are more likely to judge race by visual cues. In addition, the majority of research that has considered attitudes towards the Police in an ethnic context originates from America, and as such, 'race' is used interchangeably within the review, with the proviso that the results may not be directly transferable to the New Zealand context. Since this thesis is produced in the New Zealand context, it is appropriate that the Statistics New Zealand definition of ethnicity is used.

Jackson & Bradford, (2010) equate motive-based trust to the level in which the Police are perceived to be "on the same side" as the public (2010, pp. 246). Given that it is the dimension of trust which most relates to inter-personal treatment, it may be expected that motive-based trust is the attitude in which ethnicity may have the most significant role in predicting. Yet, Tyler (2005) found that demographic variables, including race, only accounted for 1% of the variance he found within a regression model for motive-

based trust (2005, pp. 336). Whilst Tyler did not find the overall level of this trust to differ according to ethnicity, he did find that the importance of the concepts that constituted motive-based trust varied across ethnic groups; white Americans valued the ability to have input into decision making, whilst African Americans valued quality of treatment more (2005, pp.336). One would expect, therefore, that this level of trust may initiate more intra-group solidarity amongst ethnic groups (as opposed to inter-group divergence) and thus would be more susceptible to the influence of a voice that conveys the social meaning of shared ethnicity.

If motive-based trust invokes the notion of shared norms and behaviour within a given group, it stands to reason that Tyler's (2001; 2005) Americanised results may not hold across ethnic groups in other jurisdictions where ethnicity may have more salience in predicting the overall level of motive-based trust. Indeed, using the Group Value Model proposed in Lind & Tyler (1998), Murphy & Cherney (2011) argue that procedurally just treatment will only have an effect on a person's attitudes if the individual's sense of self-worth is associated with the majority group whom the Police typically represent (Murphy & Cherney, 2011, pp. 249-250). In their study, the researchers classified ethnicity in a binary manner between the "Anglo-Saxon majority" and the "non-Anglo-Saxon minority" in an Australian context and, unlike previous American studies (e.g. Tyler et al., 1997 – as cited in Murphy & Cherney (2011, p. 238)) they found ethnicity interacted with level of procedural justice in predicting willingness to cooperate with the Police (Murphy & Cherney 2011, p. 250). It is noteworthy that the minority respondents within Murphy & Cherney (2011) included those of Māori descent, although they do not report on the weighting of this group in the overall minority category (2011, p. 238). The researchers attributed the difference in results to American minorities being more culturally inclined to identify with the combined notion of a national "American" identity, whereas "Australian philosophy proposes that different cultures mix, but should remain distinct in their own right" (2011, p. 250). Therefore, Australian minorities did not identify with the Anglo ethnicity represented by the Police and procedurally just behaviour did not affect respondents' sense of worth in relation to the inner-group (Lind & Tyler, 1998 – as cited in Murphy & Cherney, 2011, pp. 249-250). Not only does this indicate that predicting trust towards the Police is culturally dependent, but it also reinforces the fact that a predominately Anglo-driven system of attitude evaluation is unlikely to reflect a complete picture of the multicultural public that they serve. It also suggests that minorities who hold a strong sense of intra-group identity are less likely to have a harmonious relationship with the Police (e.g. Cao, 2014; Eades, 2003; O'Brien-Olinger, 2016; Thompson & Kahn, 2016).

In contrast to other post British colonial societies, New Zealand is an officially bi-cultural country based on a founding relationship between Māori, the indigenous peoples, and those who identify as New Zealand European (Pākehā); historically the colonisers. Therefore, even though Māori are the minority group, it would be expected that the justice system is culturally adequate for both cultures but in practice, this is not the case. The system predominantly retains its Anglo-centric foundations, which is evidently to the

detriment of the indigenous people: Māori¹ represent the highest proportion of unique offenders (38.2% in comparison to Europeans at 37.3%) (New Zealand Police, 2018²) – despite only constituting 14.8% of the New Zealand population in the 2013 Census ³ (Statistics New Zealand, 2013). This well-known and long-standing discrepancy has been a prime focus of NZ Police research over the last few decades, particularly after the focus group publications on Māori opinions of the Police (Te Whaiti & Roguski, 1998) and on Police opinions of Māori (Maxwell & Smith, 1998). Although Māori were present in the Police force at this time, they were severely underrepresented and the latter report illustrates that they were known to experience internal discrimination. The annual Citizen Satisfaction Survey (CSS) (Gravitas, 2017) commissioned by the Police consistently continues to report lower levels of trust and satisfaction with the Police amongst the Māori community than the European majority. Furthermore, there have been reports of ignorance towards Māori culture within the Police force but there were at least some officers who recognised that a more culturally appropriate response was required (1998, p.24). Perhaps what makes New Zealand's situation unique is that the colonizing settlement process is arguably incomplete, with Māori still advocating for principles of the Treaty of Waitangi to be upheld and applied to the modern day context (Rata et al., 2008). Thus, it can be expected that Māori are more likely to express a lack of institutional trust than respondents of NZE ethnicity. As in-group solidarity is perceived to be a core component of Māori culture (Houkamau & Sibley, 2010, 2015); an interaction between motive based trust and ethnicity can be expected, as with Murphy & Cherney (2011).

3.3 The concept of Voice Activation

3.3.1 Defining voice activation in context

Now that the background context has been provided, this review will now move onto the theoretical framework and experimental applications of voice activation. This thesis aligns with MacFarlane, (2014) in using the definition of priming behaviour provided by Bargh et al., (1996) as a starting point:

“the incidental activation of knowledge structures, such as trait concepts and stereotypes, by the current situational context” (Bargh et al., (1996, p.1) as cited in (MacFarlane, 2014, p. 8))

The last clause is the most crucial for the purpose of this research, whereby the focus is on the effect of varying the situational context in terms of both the mode of the stimuli (voice or text) as well as the social context (perceived ethnicity of the speaker). From here on, then, “voice activation” (to use MacFarlane's (2014) terminology) will refer specifically to an attitudinal response of a listener, deemed to be triggered by the perception of linguistic properties of voice and consequent association with social meaning.

¹ It is not clear how people of mixed ethnicity (arguably a more common occurrence than sole Māori ethnicity) translate into Police statistics, given that their manual to offender reports notes “ethnicity is classified by using *one* of the categories below” (PoliceData, 2016:15 – my emphasis).

² In the most current New Zealand Police reporting period of April 2017- April 2018.

³ The 2018 census population statistics are yet to be published at the time of writing.

It is the aim of this thesis to uncover whether voice activation occurs in attitudinal responses to the Police with the stereotypical association of Māori with crime, as expected due to their prominent overrepresentation in the justice system. The working hypothesis is therefore:

- H.1. There will be a significant effect on reported attitudes towards Police according to whether a stimulus voice is perceived as Māori

MacFarlane's (2014) investigation on the effect of voice as a prime of various social stereotypes is a good foundation to build upon and it is to his work that this discussion now turns.

3.3.2 Building upon MacFarlane (2014)

The relevance of societal membership on the activation of attitudes by voice was explored by MacFarlane (2014) according to "category assimilation", where he hypothesised that participants would be more sympathetic towards stereotypical groups if there was a match between the voice stimuli and social theme (2014, p. 52). These stereotypical "concepts" included: an older male for age (perceived to be in the 50s age range), a gay male for sexuality, an Asian male for ethnicity, a female for gender and a young heterosexual male used as a comparison (MacFarlane, 2014, p. 55). Both the gay male and the Asian male were perceived to be within the same age range (in their 20s) as the male used for control, whilst the female was perceived to be in her 30s (MacFarlane, 2014, p. 55). MacFarlane recruited 245 university undergraduates to an online survey in which they were randomly allocated to one of the five voice conditions and were asked whether they agreed or disagreed to statements across each of the themes (2014, pp. 53-54). His respondents significantly supported the social themes more for the female voice than all male conditions, with the exception of the gay male voice, yet crucially, no interaction was found between the voices and the social themes (2014, pp. 59). This does not support the working hypothesis (H.1) of this paper, but there is evidence to suggest that perceived ethnicity, with a comparative focus on Māori-Pākehā relations with the Police, will trigger either category assimilation, or conversely, category divergence (see below). MacFarlane, (2014) then tested whether there was a stimuli gender effect, or whether there were other attributes specific to the individual female's voice which led to more support in this condition than in the male conditions (2014, p. 62). He replicated the experiment with new respondents and used an even number of female and male voices (2014, p. 62). This time, he did not find an effect of stimuli gender but found that female respondents overall were more likely to be supportive than male respondents (2014, p. 64). This led him to repeat both experiments from a new perspective; rather than subjectively analysing answers according to supportiveness, he used a logistic mixed effects regression model to predict the probability of respondents agreeing to the statements and found that respondents were significantly less likely to agree to a statement read by a male voice than a female voice (MacFarlane, 2014, pp. 66-72). Given this evidence of voice activation with gender, as a control, the current study will evenly balancing gender across ethnicity. However, as with MacFarlane (2014), a hypothesis in relation to gender can only be specified at the generic agreement level.

- H.2. Respondents are more likely to agree with the statements, regardless of the content, if the stimuli is perceived ⁴ as female as opposed to male.

The discrepancy between MacFarlane's (2014) results for general agreement in comparison to his concept of social supportiveness emphasises the issues that researchers face when attempting to measure a latent supportiveness attitude from ambiguous statements (MacFarlane, 2014, p.66). Unfortunately, MacFarlane (2014) could not pursue this element of his survey experiments any further (for example with exploratory factor analysis as per Reynolds et al. (2018)), due to the respondents providing a binary rather than a scaled numeric answer. The present study will account somewhat for the potential ambiguity in measuring an attitude using statement stimuli, with participants rating their responses on a 5 point Likert agreement scale, which will allow for a static numeric agreement value per each answer. This can then be used to correlate related statements into components, and establish the weighting of each statement's influence using Principle Component Analysis (PCA), which MacFarlane (2014) applied in later experimental tasks (concerning themselves more with behavioural responses than attitudes towards social issues). Although a factor analysis in the same vein as Reynolds et al., (2018) would be appropriate to confirm the groupings as robust factors (and therefore attitudes), this approach requires more complexity and assumptions to be met (Field et al., 2012), and is therefore beyond the scope of this thesis. PCA will, however, provide a form of validation against the measures of trust and distributional fairness that will be constructed in line with MacFarlane's (2014) measure of supportiveness.

MacFarlane's conclusion that the gender of the stimuli affects the likelihood of the respondent agreeing to the statement is only tentative, however, because other unmeasured attributes, relating more to the listeners' perception of the individual speaker's personality may have ultimately been responsible. MacFarlane (2014) acknowledges this on the basis of the qualitative comments he received with the survey, with less favourable comments towards the male voices (MacFarlane, 2014, pp. 82–83)). He did attempt to control some aspects that may have otherwise led one speaker to be perceived friendlier than another. For example, speakers who approximated the same amplitude (2014, p. 56) and loudness had previously been found to be positively correlated with perceived friendliness (e.g. 75dB in comparison to 70dB) (Robinson & McArthur, 1982). However, by extension, if listeners do not perceive the voice to be clear, this is likely to affect their responsive behaviour (Robinson & McArthur 1982) and MacFarlane (2014) only used his own judgement of clarity (2014, p.56) without validating it against the listeners' judgements. As with MacFarlane (2014), it is beyond the scope of this thesis to measure the relationship between linguistic and extra-linguistic features that may be present in the voice sample with their consequential effects on perception of the individual speaker. However, further controls will be put in

⁴ The hypotheses throughout this thesis refer to "perception" of stimuli gender and ethnicity rather than solely gender of voice or actual ethnicity condition because it also refers to those in the text condition who guessed the gender and ethnicity of the witness in a fictitious scenario, which was also included within the survey task. More detail is provided in the future research chapter 8.

place by asking respondents to rate the voices (e.g. for friendliness and clarity) and these will be analysed as additional predictors within the statistical analysis.

3.3.3 Comparing stereotype activation from voice to text

To the author's knowledge, MacFarlane (2014) is sole research on the priming of attitude behaviour which explicitly compares voice to a text-only baseline condition. He did this by adding 75 respondents who completed the survey in a text-only condition and compared that to the respondents who had heard male or female voices across the themes (MacFarlane 2014, p.73). He confirmed his prior stimuli gender results and also found that the only significant difference between the text and voice was with the male condition, which led him to conclude that it was the male stimuli that was prompting the gender effect in a negative direction, rather than the female stimuli prompting more agreement. ((MacFarlane, 2014, pp. 74–75). He attributed these effects as being a feature of culture where the stereotypical features of male objectivity and female empathy may have “subtly” been invoked within the cues of the voice to “use an anchor to base their decision on”, although he noted this did not imply the stereotypes were activated against the speaker themselves (MacFarlane, 2014, pp. 83–84). As there was no interaction between the text baseline comparison and the female voice condition, this suggests that listeners will not always rely on vocal cues for task-related behaviour such as forming attitudes (as indeed MacFarlane (2014) discusses, (p. 57). Yet, because he did not combine audio conditions and compare the results to the text condition, it is difficult to infer the extent to which voice in general is relied upon when forming an attitude.

MacFarlane (2014) suggested that voice activation is a result of the listener using any resources available within the immediately accessible context (2014, p. 57). If correct, it would imply that if social membership categories were primed for users in the text condition (e.g. seeing the word ‘gender’ or ‘man’ prior to the survey), this would activate the same cultural concepts and the likelihood of responding in accordance with these stereotypes would be subject to the same constraints as in voice. Therefore, there is a need to investigate the effect of overall voice priming by separating the mode of contact (audio and text) from perception of ethnicity, and explicitly testing for an interaction between the two, after priming the text control group with the concept of gender beforehand. However, a directional hypothesis on the effect of voice cannot be determined until consideration is given as to the predictors of voice activation itself, which is the focus of the next section.

3.4 Predicting Voice Activation

3.4.1 Familiarity and relevance

MacFarlane (2014) related his most significant findings to familiarity of the speaker to the listener. The homogeneous makeup of his participants reacted to the speaker who resembled the closest demographics (in terms of age, perceived sexuality and ethnicity) (2014, p. 159). MacFarlane (2014) thus suggested that voice activation occurred due to respondents' pre-existing schematic experience associating the task of opinion forming on that particular topic with people of that particular group,

whereas the distance was greater between the respondents and the speakers of the other categories (2014, p. 159). Citing Schwarz (2003), MacFarlane (2014) argued:

“...for participants with a low stereotype relevance, they judge the object in congruence with the accessible construct. For those with personal relevance, they judge the object against that construct.” (MacFarlane, 2014, p. 159).

MacFarlane (2014) appears to have interchangeably used the terms ‘relevance’ and ‘familiarity.’ However, it is reasonable to assume that the more familiar a respondent is with Māori culture; the more relevant Māori ethnicity is likely to be as a factor of voice activation. There are survey components which could be used to determine the extent to which Māori ethnicity is relevant for respondents. First, the Multidimensional Model of Māori Identity and Cultural Engagement (MMM-ICE) seeks to understand the current level of wellbeing, needs and values for people who either ethnically identify as Māori or have Māori ancestry (Houkamau & Sibley, 2010). Its prominent focus is on internal beliefs and values, as well as respondents’ perceptions of how they believe they are perceived in society (Houkamau & Sibley, 2010). However, this tool is less applicable for New Zealand Europeans, for whom the Māori Integration Index (MII) (Szakay, 2007) is a better measure of the respondent’s familiarity with, and perceived relevance of, Māori culture. Despite the fact that its methodology still relies on a binary classification of either “Māori” or “Non-Māori” identity, this tool is more in line with the fluid construct of ethnicity, recognising that biological descent is not necessarily equivalent with the extent of the individual’s engagement with Māori communities and culture (Szakay, 2007).

MacFarlane’s (2014) statement would therefore suggest that the higher a listener’s score on the MII, the more likely the listener would be to judge the Māori speakers’ statement in accordance with their own views, which would stereotypically match that of the speaker. Thus, if they have more positive associations with Māori, they are likely to express less trust in either the Police in a Māori condition or a NZE condition. However, MacFarlane’s (2014) findings of an apparent negativity bias to the male voice from respondents perceived to be of the same social membership groups suggests the opposite may be true; that respondents may diverge themselves more from the views stereotypical to their ethnic group. Yet, if Māori ethnicity had no personal relevance to the respondents, they are more likely to use the voice to draw upon accessible knowledge. Therefore, these respondents would be more likely to report lower levels of trust in a Māori condition, drawing upon accessible knowledge of relations between Māori and the Police, than in a New Zealand European condition, whereby they would not be primed to draw upon this knowledge.

However, a distinction between ‘familiarity’ and ‘relevance’ is important here, given that the relationship is not necessarily bi-directional; a person may not be overly familiar with Māori culture but, for example, may hold pre-existing prejudicial attitudes that make the ethnicity of the voice a relevant attribute for voice activation. Furthermore, if previous contact with the Police does indeed have more weighting than race/ethnicity (Alberston & Gorey, 2018) in a New Zealand context, the situation becomes more complex,

as relevance is more likely to rely upon their previous experience. Therefore, using MacFarlane's (2014) logic, those without Police contact would rely more upon the voice stimuli than those with personal experience. Thus, if they hear a Māori voice, they could judge the Police more harshly than if they hear a NZE voice but this would then depend upon the relevance of ethnicity to the listener. Should this respondent only have a text cue, it would be expected that they refer to their own background knowledge from experiences within their social network and the representation from the media – which may or not include relevant perceptions of ethnicity. Conversely, those who have had a positive or negative experience with the Police would be expected to overrule any relevance the ethnicity had to the individual, especially those who were dissatisfied, given the known negativity bias described in section 1 (e.g. Skogan, 2006).

The relevance of the stimuli to the listener may actually be more important for the deliberation stage of attitude formation (Krosnick et al., 2014, p. 25). Familiarity, in contrast, could be argued to be a factor in both the initial activation and deliberation stage of a behavioural response. For example, Huang et al., (2011) found a familiar font (Arial) primed respondents to have more trust in market forecasts than a creative font – clearly no association of relevance of font can be made here. Furthermore, Song & Schwarz(2008) found that familiarity of fonts affected participants ability to spot false statements, with the least familiar font prompting more intensive processing and thus the participants paid more attention to the content than the familiar font, which the participants automatically responded quicker to. For the purposes of this study this type of result suggests that, the more familiar the respondent is with the prime, the more likely they are to form an opinion more quickly. The less familiar they are with the prime, the more likely the opinion formation becomes more deliberate than automatic. Humans are social by nature; therefore it is expected that respondents will be more familiar with any voice than text, due to the high probability that they will be exposed more to spoken language than written language.

Crucially, familiarity with the stimuli voice can effect one's ability to perform high-level semantic processing of associating emotional valence with the content, as Hatzidaki et al., (2015) found when trialling participants with “native accented” stimuli as opposed to “foreign-accented” stimuli. Specifically, they investigated the response times to a categorisation task, assigning options to either a “something they could touch” or “something they couldn't touch” category, with the primary independent variable being the words' emotional valence (positive, neutral or negative) (Hatzidaki et al., 2015, p. 3). Having validated the intended valence with their participant's ratings on a 9-point Likert scale, they used electrophysiological technology and found that both groups of monolingual Spanish participants were slower to react to neutral words than either positive or negative (“emotional”) words but the “non-native” stimuli interfered with the reaction times for positive words; thus speculating a “negative-bias” for that stimuli control (Hatzidaki et al., 2015, p. 7). The ecological validity of Hatzidaki et al.(2015) to real-world discrimination based upon voice is arguably low, given that the words were not presented to listeners in context (2015, p. 9). Yet, it offers evidence for the significance of stimuli familiarity at the linguistic level,

with less familiar (non-native) stimuli requiring further cognitive processing at the expense of the more resource intensive processing of emotive content (Hatzidaki et al., 2015, p. 10). Although MacFarlane (2014) found that the voice perceived to be most familiar to his participants (that of the young male) conversely prompted the negative bias (2014, p. 159), the findings in Hatzidaki et al., (2015) would imply MacFarlane's (2014) respondents were more able to process the cognitively demanding task of arguing against the attitude conveyed by the speaker when they were more likely to have had a frame of reference between the speaker and the task at hand.

Familiarity and relevance hypotheses:

- H.3. Voice activation will only be evident (shown by the overall mode of stimuli independently or interacting with perceived ethnicity) for predicting attitudes towards the Police when the respondent has not had any recent Police contact.
- H.4. There will be an interaction between perceived ethnicity and respondent ethnicity (either through MII score or ethnicity);
- H.5. When Māori ethnicity is less relevant to the listener, the dependency on the voice to shape their opinion will increase with a Māori voice condition prompting less trust in the Police.
- H.6. When Māori ethnicity is more relevant to the listener, there are two potential directions:
 - a. Indifference to voice: respondents will report less trust in the Police.
 - b. Negativity bias: respondent will report more trust in the Police in a Māori condition than a NZE condition.

Arguably, however, the most relevant measure in assessing the respondent's familiarity with the target ethnicity of the voice is explicitly asking them to identify the ethnicity of the voice. This would need to be at the end of the attitudinal task, to avoid overtly priming the respondent to ethnicity when they might not have been susceptible otherwise. Whether their response was correct or not would validate the assumptions of familiarity. Therefore, section 3.4.2 will now turn to consider how the social construction of ethnicity can be perceived from voice.

3.4.2 Perception of ethnicity from linguistic cues

Ethnicity is a fluid construct and language allows the speaker to 'choose' (the word is used loosely here as it does not necessarily imply agency) how to convey this identity as they perceive appropriate in a given context (Benor, 2010). Yet, people still perceive a categorical ethnicity from voice, as Purnell et al., (1999) found when their participants correctly guessed ethnicity 70% of the time, based solely on the one-word utterance "hello" (Purnell et al., 1999, p. 22). Although this is a short utterance, there is a vast array of

literature which reveals that individuals do have a consistent sense of socio-phonetic variation and they are able to attribute certain features to particular group.

Most relevant to this study is the perception of Māori ethnicity and the extent to which this varies from the standard New Zealand English (although 'standard' in this context is admittedly an oversimplified abstraction of the variety which is most widely used by Pākehā speakers - (see King, 1995; Maclagan et al., 2008; Szakay, 2007). To give an example of the phonetic variation, the fronting of the GOAT vowel appears to be a feature of Māori English (Szakay et al., 2012, p. 14), and is at least recognized by bilingual English-Te Reo speakers, who are able to respond to a prime more efficiently when they hear the Māori English GOAT vowel as opposed to the standard New Zealand English pronunciation (Szakay et al., 2012). Although it seems to be determined by one's level of exposure to the Māori community, monolingual NZE speakers are able to identify Māori speakers from suprasegmental features such as a lower pitch and a slower tempo and more hesitations (Szakay, 2007). Māori English has also been characterised as having more a more frequent occurrence of /z/ devoicing (e.g. Holmes, 1996; Maclagan et al., 2003). There is not yet any evidence on to suggest that this is perceptible to non-linguists, but it appears that even non-salient features can trigger associations of social meaning. For example, De (2017) found that fronting and backing of the /u:/ vowel in the word "dude", significantly correlated with participants' classification of an American speaker's race.

Perception of ethnicity from linguistic cues is not a fixed phenomenon, however, as Hay and colleagues have shown that participants can be primed to perceive vowels in accordance with environmental primes, despite using the same voice stimuli across conditions (Hay & Drager, 2010; Hay et al., 2006; Niedzielski, 1999; Hay & Drager, 2010). These primes can be explicit text i.e. the words "New Zealand" or "Australian" (Hay et al., 2006) or more subtle cues such as the presence of a stuffed toy representing the target response (Hay & Drager, 2010). These linguistic cues become exemplars to which social meaning is activated or reinforced, in accordance with the contextual information available at the time (Drager & Kirtley, 2016). Furthermore, listeners may assign different social meaning to the same linguistic feature according to their perception of speaker ethnicity. For example, NZE speakers have been perceived as unconfident due with frequent hesitations in their speech whereas this is not the case for Māori English speakers with the same frequency of hesitations (Peach, 2016). It appears therefore that NZE listeners can recognise hesitations as a natural part of Māori English rather than attribute it to disfluency (Peach, 2016). Yet, this does not mean that Māori English speakers are free from negative connotations, as Holmes, et al., (2001) found that these speakers were perceived as less educated, intelligent and of a lower social class than speakers who were perceived to be of NZE ethnicity.

To recap, people can perceive ethnicity and form attitudes accordingly, from subconscious linguistic cues on a macro-linguistic level (from acoustic features in the voice) and on a phonetic level, across features that do not stereotypically constitute an "accent." Yet, they can also be primed to perceive the linguistic feature according to a given stereotype. Arguably, therefore, there must be a bidirectional relationship

between perceived linguistic features and social attitudes (rather than just perception of social category). Levon (2014) found evidence that suggests this is the case, as participants who had a higher tolerance towards gay communities were less likely to perceive a stimuli utterance created with exaggerated sibilance on /s/ as 'gay', and those stimuli with a modified, higher pitch as 'less masculine' (in comparison to the same stimuli with the same participants normally pronouncing /s/ and with their usual F0 pitch) (Levon, 2014. 553).

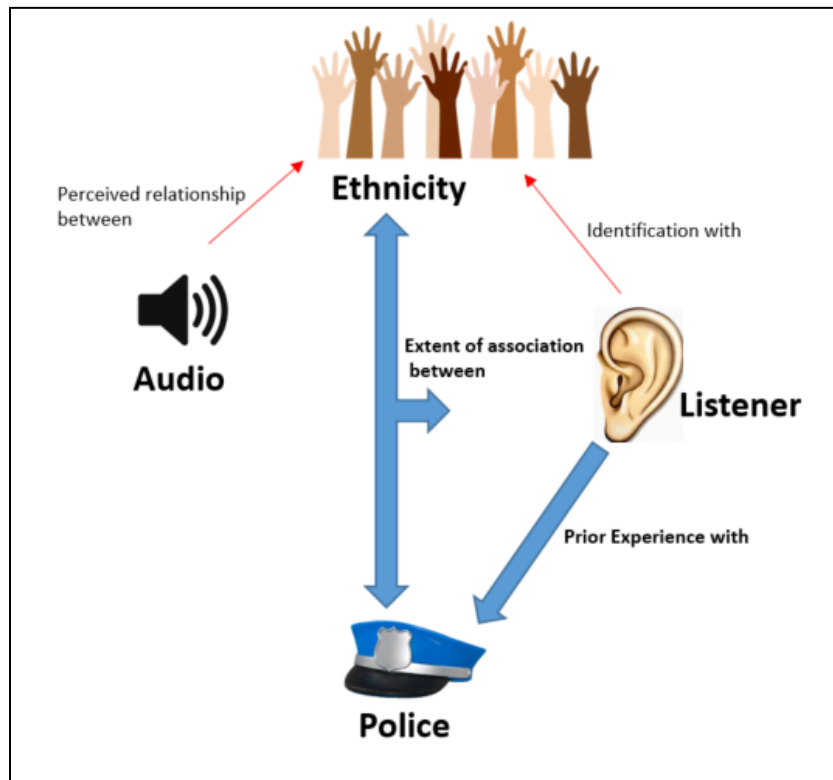
This raises a methodological issue for ethnicity and attitudinal priming research as we have a somewhat contradicting issue: a participant is not only more likely to perceive features as belonging to an ethnic group if they have had exposure to the community but also if they have somewhat negative attitudes towards that group. Therefore, if these extra-linguistic contextual features can prime the perception of ethnicity from linguistic features, then how can we decipher the attitudes that change as a *result* of hearing these voices? As such, this discussion has reinforced the need to measure attitudinal variables not directly associated with the prime., The perception of the linguistic features in themselves are unlikely to convey social meaning in the context of attitudes towards the Police; for example the speaker simply having a lower pitch is unlikely to invoke a lack of trust in the Police unless the listener perceives this feature in context of social meaning. Thus, it may be possible to directly attribute any variation of attitudes towards features of voice that are associated with a given ethnicity. The next subsection will therefore consider whether voice activation can be determined according to the strength of association between the voice, the perceived ethnicity and Police attitude response variable.

3.4.3 Association between the stimuli, the target attitude and the listener

So far it appears, then, that the likelihood of voice activation within the context of an analysis of attitudes towards the Police is dependent upon the weighting of (perceived) relationships between the audio, the target stimuli as well as the listener's individual experience with both ethnicity and the Police.

This is best conceptualised in diagram form, as shown in Figure 3-1 below. Firstly, as discussed, in order for any priming to occur due to ethnicity, the listener must have familiarity with the target ethnicity and perceive the audio as a representation of this group. The extent to which the listener identifies with a given ethnicity and their subsequent alignment with the ethnicity perceived from the voice (their intra/inter-group status) is the next determining factor. Once these requirements are met, there are two contending factors in one's likelihood to be primed: the listener's individual experiences with the Police (with those who are dissatisfied more likely to have the opinion most resistant to the overall influence of ethnicity (c.f. Alberton & Gorey, 2018)) and the listener's association between the construct of ethnicity (the prime) and the target object in which they are asked to evaluate, the Police.

Figure 3.4-1: Conceptual Map on the Likelihood of Voice Activation by Perceived Ethnicity, in Context of Attitudes towards the Police



Note all clip art images used within this original diagram are reproduced with a creative commons license

This conceptualisation illustrates language, in terms of perception in particular, as a joint collaboration of meaning between an individual and society be that with another individual in discourse or the collective forming of attitudes across groups, which is a core assumption of linguistic frameworks that cross into the realm of psychology. Socio-cognitive linguistics uses the concept of “communal common ground” which allows an individual to communicate across and between all levels of social membership groups, with familiar as well as with new people (Croft, 2009, pp. 406–409). In this way, the likelihood of an individual’s linguistic behaviour resulting from a potential voice prime is not only dependent upon their own knowledge and experience regarding the Police and members of other ethnic groups (both independently as well as in relation to one another) but also that of their social network. The strength of association between the perceived ethnicity of voice and the concept of the Police also thus relies upon the strength of common ground the individual shares with the concerning societal groups. This has significant implications when the type of police contact has been shown to be the highest predictor of trust, closely followed by race/ethnicity (Alberton & Gorey, 2018) – and particularly when this negative police contact is clearly a shared experience within the Māori community (Te Whaiti & Roguski, 1998). The regularity of negative contact is arguably to such an extent that feelings of procedural injustice within the Māori community are in danger of becoming a “convention” (c.f. Croft, 2009, pp. 401–402).

Crucially, however, the notion of common ground applies at any level of discourse, including the simulated discourse here with an audio recording requiring a listener's response, given that all language is some form of "joint action" (Croft, 2009, p. 398). Thus, the listener will attend to the speaker's voice (as well as other situational factors) to determine the extent to which there is shared common ground; the speaker will have their own interpretation of semantic meaning behind what is being said, for example the connotations with the word "trust" and will attempt to convey this to the listener using linguistic cues accordingly (c.f. Croft, 2009). The framework of Communication Accommodation Theory elaborates on how speakers achieve this joint action of conveying meaning by indexing their social identity to an extent that is comprehensible to the listener, for example through the use of prosodic cues and discourse features, (Giles & Gasiorek, 2013). The success of communication as a joint action depends on the extent of shared common ground (Croft, 2009), i.e. whether on a more generic level as citizens with the same Police force or within an ethnic group. Consequently, the more the listener perceives to have shared common ground with the speaker, the more voice activation may result in the form of attitude convergence. Communication Accommodation Theory traditionally shares the view that convergence with another speaker is preferred by default and if the listener's response is seen as a linguistic action, this would facilitate interaction; yet the extent of convergence is strongly dependent on the listener's perception of the speaker's intentions and motives, as well as their own desire to affiliate themselves with one another (Giles & Gasiorek, 2013).

In summary, the literature on voice activation presents a dynamic landscape that is best explored from both the psychological perspective - the cognitive association of the prime reinforcing individual's prior experiences in combination with the situational context – and the linguistic perspective, which frames the response in terms of the listener's communicative intent and application of social meaning to language. The few studies that have contributed to this field of voice activation have so far found that voice does have an effect but often not in the hypothesised direction. For example, in Hatzidaki et al. (2015) the effect of audio condition was only significant in the context of an interaction with word valence whereas in MacFarlane (2014), whilst the audio condition was independently significant, it did not interact with the matched social-groups. These studies suggest a likelihood that voice activation can be predicted according to the familiarity of the stimuli, the strength of association between the stimuli and the target attitude and the individual's motives. There are so many linguistic cues that contribute towards social meaning in voice, it is hard to imagine that there will not be an overall effect of voice activation on attitudes, in comparison to text-based stimuli.

A cross-group effect between respondent ethnicity and perceived ethnicity is expected to be more apparent within the present study than the null effect found in MacFarlane (2014), because the strength of association is arguably stronger between the stimuli (when the perceived ethnicity is Māori) and the target response (attitudes towards the Police) than the Asian voice is with broadly themed immigration questions (c.f. MacFarlane 2014, p. 194). This is likely further reinforced due to the active promotion of

the joint Police- Māori initiative, The Turning of the Tide, which aims to rectify these stereotypical attitudes of Māori and crime and implement a cooperative approach to dispensing justice, whereby offenders are offered alternative justice measures in accordance to Māori customs (New Zealand Police, 2012). The media are actively covering the initiative, criticising it for inadvertently reinforcing the divide with more Pākehā offenders being offered alternatives to prosecution than Māori (e.g. Parahi, 2018). The two overall measures of trust and fairness should therefore help to clarify whether the Police and the media have now effectively managed to create a more sympathetic association between Māori and crime; should there be an effect of Māori voice on lower reporting of perceived distributional fairness and/or trust, this would appear to be the case.

The critical issue of course is to what extent the judgement of perceived ethnicity has on the behaviour of the interpreter of these visual and/or audio cues. If reactions to a voice can alter semantic processing and categorical assessment of unrelated stimuli (Hatzidaki et al., 2015), then it stands to reason that its interference may extend to the cognitive process of evaluating and forming an opinion against the seemingly unrelated stimuli. MacFarlane (2014) argues “the voices, and the task demands, are only unrelated as far as rational, normative decision making goes” (2014, p. 115). The relevance of perceived race/ethnicity from voice on behavioural responses is widely established, for instance the likelihood of assisting in an emergency as shown by Gaertner & Dovidio(1977) who found that white Americans were more likely to assist a black female if the victim was alone, yet more likely to assist a white female if she was not alone. In addition the ethnicity of the interviewer has been found to influence respondents' actual ability to answer factual questions; Davis & Silver (2003) for instance found African American respondents were less likely to give correct answers to a political knowledge questionnaire when asked by a white interviewer rather than a black interviewer. There is also evidence that perceived ethnicity of interviewers is able to prime a different attitudinal response; Adida et al. (2016) have recently found an interaction on a political opinion survey across African countries between the respondents' ethnicity and that of the interviewers, particularly where the ethnicities concerned have experienced conflict (2016, p. 1652).

To understand behavioural responses to a prime, it is now evident that the intended meaning of the prime from the listener's perspective must be considered as a product of inter-group interaction as well as a result of the individual's extent of alignment with their inner group. Therefore further knowledge on social group structure from a wider perspective is required, in addition to the current literature on priming. This is the focus of the following two sections, before summarising how current knowledge can be applied to the context of ethnicity and attitudes towards the Police.

3.5 Attitudes and inter-ethnic group behaviour

If voice priming is activated by personal experience and/or judgement on the attributes of a voice, one could argue that voice activation is an overly simplified account because it implies that individuals have no agency in controlling their initial evaluative response. However, given the social sensitivity surrounding

the issue of ethnic relations, it is known that people are less likely to report negative attitudes towards other groups for fear of flouting socially acceptable norms of behaviour and tend to default towards social convergence rather than divergence (Giles & Gasiorek, 2013). As such, psychologists have aimed to measure people's default activation of response to a stimuli, referred to as an implicit attitude. The most well-known research in this area is the Implicit Association Test (IAT), established at Harvard University by Greenwald, Banaji and Noeske (as described in Nosek et al., 2007). Although participants are explicitly aware of the predictor being tested, e.g. racism, sexism or homophobia, the idea is that by engaging the respondent in an activity, matching pictures interchangeably with associated concepts or evaluations (e.g. "black" and "white" with "good" and "bad") in a time-pressured environment, they will reveal their underlying attitudes, responding faster to conceptual links which they subconsciously subscribe to. Yet, as MacFarlane (2014, p. 52) notes, even these results are not free of external influence; citing Dasgupta & Greenwald's (2001) study on the influence of prior exposure to given associations (e.g. participants were more negative if they had prior exposure to "disliked black people" in the media). This may therefore have implications to the current study, whereby, as stated, Māori are commonly associated with the Police in current media. However, as Krosnick et al. (2014, p. 63) argue, measuring implicit associations is not necessarily a more valid form of research, particularly in the applied context whereby it is crucial to understand the effects of influence in the realistic complex situation that is inter-ethnic relations. Furthermore, Santos (2014) argues that explicit and implicit attitudes are separate responses that can co-exist and reflect different values at the same time. The next part of the discussion will detail how this is apparent between the two largest ethnic groups in New Zealand.

There has been substantial research on inter-group relations in New Zealand within the last few decades. According to Rata et al., (2008), many Māori do not feel enough remorse has been expressed on behalf of their ancestors and it is this notion of 'whakapapa', the connection between Māori people across time and space and interdependency as a collective society, which Western cultures are arguably not able to empathise with (Rata et al., 2008). In fact, Pākehā often subscribe to the view that the racial divide is outdated and irrelevant in modern day New Zealand, and that both groups need to assimilate under one nation (Nairn & McCreanor, 1991); by virtue refuting the concept of biculturalism where Māori rightfully hold and receive resources for the benefit of their people. On the other hand, traditional Māori culture is perceived positively, in almost a nostalgic manner as a maker of identity that separates New Zealand from the rest of the Anglicised world (Sibley & Liu, 2007; Sibley & Osborne, 2016). This was made evident in Sibley & Liu, (2007), whereby Pākehā participants who performed an implicit association test between visual stimuli relating to New Zealand (the flag, maps of New Zealand, a "made in NZ" logo, a picture of a Kiwi and a silver fern), as opposed to "foreign" which included the Kiribati flag, Flemish lion and maps of Luxembourg (2007, p. 1126) associated both Māori and Pākehā ethnicities with the concept of New Zealander (contrary to their association of Asian New Zealanders) and with their implicit ratings were consistent with their explicitly stated views. Furthermore, there was a "weak" tendency for Pākehā respondents to perform better in an in-group condition (as there was with Māori), which was removed

when faces of Māori and Pākehā rugby players were used instead (Sibley & Liu, 2007, p. 1238). Thus, confirming the prominence of Māori in New Zealand symbolic “export” culture (Sibley & Liu, 2007, p. 1224-1225). However, when Pākehā who performed the IAT test and scored more favourably towards Pākehā stimuli were assessed on more detailed explicit attitudes towards group relations within New Zealand, they also scored a higher level of “right wing authoritarianism”, indicating a need for collective security (Sibley & Liu, 2007, p. 1224-1225).

3.6 Attitudes and intra-ethnic group behaviour

It has been established that in order to predict the extent of behavioural responses to perceived ethnicity of voice stimuli in an intra-ethnic group context, it is necessary to have an understanding of the recipients’ level of affiliation with their ethnic group and how they may do so linguistically. Further exploration is needed on why the intragroup is likely to influence the respondent’s behavioural response. In fact, Tyler & Blader (2000) argue that attitudes are a more type of “internal motivational force” that should be distinguished from another type; that of values. Whilst the former reflects how one wants to behave to a given stimuli, the latter reflects how one believes they ought to respond according to the norms of the groups in which they belong to (Tyler & Blader, 2000). Thus, there may not always be alignment between attitudes and values and, therefore, the methodological implication is that voice activation may in fact be a priming of values the respondent perceives appropriate to display, more than their attitude itself.

Williams et al., (2008) provided evidence for this automatic behaviour in the context of contamination anxiety, a psychological behaviour known to be associated more with blacks/African Americans than whites/European Americans. They found blacks reported higher levels of contamination anxiety when they completed the MEIM ethnic identity questionnaire prior to the psychological assessment than if they completed this afterwards (2008, p. 753). The researchers questioned whether this was indeed an effect of priming or whether it is a self-presentation effect to avoid stereotypical bias (e.g. black people being perceived as ‘less clean’ (Williams et al., 2008, p.755). Arguably, regardless of whether it was their true attitude or was a result of self-presentation of values, ethnicity must have been the prime, otherwise they would feel less need to diverge from their inner group’s stereotype. If this was the case, then its application to this study could be contrary to the hypothesis previously described, the higher the MII index, the more likely the respondent would want to diverge from their group’s association with crime and thus present a more trusting image of the Police.

Group effects on attitudes towards the Police

Of course, an individual’s behaviour in relation to indexing their intra-group identity occurs simultaneously to evaluating their response in accordance to the interaction required in a cross-group context. The groups may also converge in reported attitudes to some degree, as Johnson et al (2017) found with the effect of the race of the driver in a factorial traffic stop on global attitudes towards the Police:

“the effect of the procedural justice condition on the global measure of willingness to cooperate with the police was larger when the driver was white than when the driver was black” (Johnson et al., 2017, p. 1203).

Johnson et al. (2007) further demonstrated the complexity of the interaction between ethnicity and attitudes towards the Police, when an interactional effect on encounter-specific attitudes was found at only one level with driver race:

“driver race does not appear to influence the encounter-specific outcomes when the respondent is not black...yet driver race does appear to influence the outcomes when the respondent is black” (Johnson et al., 2017, pp. 1203–1204)

The study by Johnson et al. (2017) provides a solid foundation to explore racial priming in both a context-specific and global attitudinal level and appears to be the only work at present with a factorial design to including both racial stimuli and Police attitudes. However, drawing conclusions upon whether the voice of the driver in Johnson et al. (2017) was linked to the perceived race is problematic, particularly given the actors were instructed to say as little as possible, so one can assume the priming of race was designed to be a visual rather than linguistic cue.

The race of interviewer, however, has been recently found to be a significant predictor on opinions towards the acceptability of Police violence, whereby Savage (2016) found that black respondents in the American GSS survey were more likely to report disapproval within an in-group condition and white respondents were less likely to report approval to a black interviewer. Yet, Savage assumed that the race of the respondent would have a significant effect based upon the prior literature and so constructed two binary logistic models accordingly (2016, p.) - as such the exact weighting of the interviewer-respondent race relationship remains unclear; indeed these effects were only found in one out of five factorial levels for each race accordingly (2016, p.153). Furthermore, Savage, (2016) only accounted for the additional demographic variables of sex, age, education, social class and region; thus there is no indication on the extent to which the individual's personal experience with the police affects their susceptibility to be primed by the race of the voice. In fact, Savage's study could make no assumptions that respondents actually perceived the race of the interviewer in accordance with the interviewer's self-identified ethnicity and so explanations of black intergroup solidarity and white self-presentation bias can only be speculative based upon a statistical interaction within the dataset (2016, p. 155). Thus, there is a clear need for a factorial survey which can measure respondents' perception of ethnicity as a predictor to their attitudinal responses towards the Police.

3.7 Priming and Attitudes towards the Police: Summary of research questions and hypotheses

There are four levels of the priming phenomenon that are hypothesised to occur within this research:

1. Overall voice activation will be deemed to be evidenced in the current study if the mode of stimuli is significant, showing a difference in responses between respondents in a text condition compared to an audio condition.
2. Voice activation as a consequence of perceived speaker ethnicity will be evident if there is an interaction between the voice conditions and the listener's perception of the speaker's ethnicity.
3. Attitude priming as a result of inter or intra-group social interactions will be evidenced should the respondent's ethnicity interact with the perceived ethnicity of the speaker.
4. Voice activation as a result of inter or intra-group social interactions will require an interaction between the mode of stimuli (voice), the respondent's ethnicity and the perceived ethnicity of the speaker.

Each level of priming is addressed within the following research questions. Research question one begins with the effect of voice on opinion overall:

Research Question One: Is a person's level of measurable support towards the Police susceptible to the influence of voice in general?

The key hypothesis in line with this research question is:

- H.7. Voice activation in general will occur across all attitude measures, with the text condition being more likely to predict a stereotypical response according to the respondent's ethnic group.

The stereotypical response relates to Māori respondents being more likely to provide more negative responses than respondents of NZE ethnicity, towards the Police. The rationale behind the hypothesis that it will be the text condition that leads to the stereotypical response is that the respondents in this condition will not have linguistic cues that are present in voice to generate a specific frame of reference from and, therefore, they will revert to their own prototypical response that had previously been formed as a result of their social group interactions.

The second research question considers what the implication from any voice activation by perceived ethnicity is on the public's perception of Māori relations and the Police. The intention is to investigate whether the extent of the association between ethnicity and the Police can be inferred from this study, as per MacFarlane's (2014) theory of voice activation and relevance of the stimuli to the listener (2014, p. 159).

Research Question Two: Does the perceived ethnicity of voice prime attitudes towards the Police and, if so, does this suggest a semantic association between Māori and the Police?

The non-directional hypothesis for this research question is:

- H.8. There will be an interaction between the mode of the stimuli (being voice), perceived ethnicity of the speaker and respondent ethnicity (either through MII score or ethnicity)

A directional hypothesis can be provided for respondents whom Māori ethnicity is less personally relevant (i.e. they have a low Māori integration index).

- H.9. When Māori ethnicity is less personally relevant to the listener, they will depend more upon the voice to shape their opinion and therefore their levels of trust towards the Police will be lower in a perceived Māori voice condition than in a perceived NZE voice condition.

However, in terms of the distributional fairness, the direction of effect of the perceived Māori voice on respondents of NZE ethnicity is less clear. On the one hand, the following hypothesis can be formed:

- H.10. Respondents of NZE ethnicity will report higher scores for distributional fairness when they perceive the voice to be of Māori ethnicity than when they perceive the voice to be of NZE ethnicity.

The above hypothesis could be formed based upon the findings of Sibley & Liu, (2007) who found that there was a preference amongst respondents of NZE ethnicity to assume one national identity, inclusive of Māori. Alternatively, for respondents of NZE ethnicity where Māori ethnicity is less relevant, they may have a greater sense of association between the specific topic of fairness and the stimuli of Māori ethnicity than they would for the generic trust attitude. This may be salient due to the media's persistent coverage of the reported disadvantage that Māori people in particular have with Police interactions. Thus the alternative hypothesis for distributional fairness levels reported by NZE respondents can be formed:

- H.11. Respondents of NZE ethnicity will report lower scores for distributional fairness when they perceive the voice to be of Māori ethnicity than when they perceive the voice to be of NZE ethnicity.

When Māori ethnicity is more relevant to the listener, there are conversely two potential directions of effect of voice on attitudes towards the Police, which are presumed to hold for both trust and distributional fairness. The null hypothesis, for these respondents fully immersed in Māori culture, relates to the association between the respondent's own ethnicity and the topic of the Police being stronger than, or equivalent to, the association between the perceived ethnicity of the voice and the topic of the Police.

- H.12. When Māori ethnicity is more personally relevant to the listener, there will be an indifference to voice and these respondents will always provide lower attitude scores towards the Police than respondents for whom Māori ethnicity is less relevant. This will be evidenced by equally low scores given for the Police by Māori respondents in the text condition.

Alternatively, as with MacFarlane (2014), respondents for whom Māori ethnicity is more personally relevant will be more likely to have a frame of reference for the association between the topic and the stimuli and thus are more likely to feel that they can express an opinion which differs from the opinion they perceive the interlocutor (in this study, the voice) has – henceforth this will be referred to as a ‘voice negativity bias.’

- H.13. When Māori ethnicity is more personally relevant to the listener, their attitudes will reflect a negativity bias towards the voice: these respondents will report more trust towards the Police in a condition where they perceive the speaker to be Māori than in a condition where they perceive the speaker to be of NZE ethnicity.

The next research question relates to all levels of voice activation in assessing the relevant importance of the phenomenon within the applied context.

Research Question Three: How important is voice as a predictor in relation to other predictors known to influence attitudes towards the Police, namely their prior experience with the Police and ethnic identity?

The theoretical implications of this question is that on a generic level it is asking how social meaning compares to the individual’s experience, in constituting the likelihood of attitudinal priming. Specific questions in this domain include:

1. Does the influence of negative police contact have more weighting than satisfactory contact, as with other jurisdictions (Alberton & Gorey, 2018)?
2. Does voice influence respondents to the same extent, regardless of their prior contact?
3. Does the influence of voice, as opposed to text, neutralise negative opinions for dissatisfied persons in line with the overall hypothesis for voice activation?

However, given the weighting that dissatisfied respondents have had on opinion variation across Police research surveys (e.g. (Skogan, 2006), it can be expected that this will again have the greatest impact on respondents’ opinions to an extent that voice activation is not evident. Thus the hypothesis for Research Question Three is:

- H.14. Voice activation will only be evident (shown by the overall mode of stimuli independently or interacting with perceived ethnicity) for predicting attitudes towards the Police when the respondent has not had any recent Police contact

Based upon the reviewed literature, therefore, the full hypothesis of this study can be formed:

- H.15. Overall voice activation will only be evident for predicting attitudes towards the Police when the respondent has not had any recent Police contact, where respondents in the

text condition will report attitudes that are more stereotypical of their group. For those in a voice condition, there will be an effect of the speaker being perceived as Māori whereby reported attitudes towards the Police will be more negative overall. There will be both an inter and intra-group effect activated in particular when the speaker is perceived as Māori.

The direction in which the Māori voice will affect attitudes towards the Police was addressed according to the alternative hypotheses proposed in Research Question Two.

Given that this thesis is situated within the overall field of voice activation, other linguistic and contextual factors will need to be considered and will be addressed by Research Question Four:

Research Question Four: Are there any (further) identifiable aspects of voice that predict opinions towards the Police?

Although abstract perceptions that can influence overall opinion towards a voice (such as perceived friendliness and perceived level of education) will be taken into account in this study, the direction of any potential effects from these factors cannot be formed from the literature that is currently available.

However, MacFarlane (2014) found that there was an effect of the stimuli gender on respondents' general agreement with statements and this will be adopted as an additional hypothesis for this study:

- H.16. Respondents are more likely to agree with the statements, regardless of the content, if the stimuli is – or is perceived to be - female as opposed to male

Again, however, the potential effect of stimuli gender on actual attitudes towards the Police cannot be formed based upon the current literature.

4 Methodology

4.1 Factorial design

There were five conditions within this factorial study: Māori male, Māori Female, Pākehā male, Pākehā female and a text control condition. As with MacFarlane (2014), the assumption within this study is that the text condition represented attitudes of each demographic group of respondents when they were not primed by a voice. Four speakers were recruited via departmental networks to represent each of the conditions, within the age range of 30-40. None of the speakers were trained voice actors, which was deliberate in order to ensure the speech samples sounded like “everyday” New Zealanders. Although no formal criteria was used for identifying Māori English, there was consensus amongst colleagues that both the speakers of Māori ethnicity displayed features known to be typical of Māori English; e.g. a more frequent use of long pauses than the Pākehā speakers. It is acknowledged that a matched guised test would have been the most ideal control of other possible variables that may prime a given attitude from a respondent, such as the pitch and tone. However, a pilot study comparing within-speaker samples, with the Māori male speaker reading in both his native Māori English and in standard NZE English (which he referred to as his “telephone voice”) was unsuccessful in that colleagues at the NZILBB department perceived his ethnicity as Māori in both samples. Thus, it was important to control for individual effects from voice, as will be discussed in Section 4.6.

4.2 Survey structure and respondent recruitment

This survey was created on the Qualtrics online survey hosting platform. Having been briefed with an introduction page, and providing their consent at the start of the survey (both of which are provided as appendices 10.3.7 and 10.3.8), participants were presented with the short scenario test. This involved the speaker or text narrator recalling witnessing a supermarket theft and the respondents were asked whether or not they supported the witness in not reporting the crime. They were then asked how likely it was that they themselves would report the crime, dependent upon the factors of crime severity and perpetrator familiarity. Respondents were then presented with the 20 statements, read by the same speaker (or presented in text if in the control condition) which were randomised to reduce the impact of order bias. Their task was to rate their level of agreement with the statement on a five point Likert scale (strongly agree to strongly disagree), which was used in line with both standardized academic research and for comparability with the Citizen Satisfaction Survey (Gravitas, 2017). This method was also chosen as opposed to methods such as the magnitude estimation technique (Bard et al, 1996), which involves the respondent comparing their answers in relation to one another (as discussed for example by Watson & Clark (2015)), in order to avoid causing respondents mental fatigue. The final part of the survey was the respondent demographic questionnaire. At this point, they were also asked to guess the ethnicity that they believed the speaker primarily identified with, from a list of choices adapted from Statistics New

Zealand. As well as Māori or New Zealander of European descent (NZE), respondents had the options of New Zealander of Asian and Pasifika. A free-text box was also offered, should they have perceived the speaker to be of a different ethnicity. Additionally, there was an option to mark if they were unsure. On average it took between 10 to 15 minutes for respondents to complete the entire survey.

In order to obtain as wide a demographic as possible, the only selection criteria for the respondents was that they had to have been mainly resident in New Zealand within the last year and consented to their anonymous responses being published and potentially shared with the Police. The recruitment was conducted mainly online, through the author and supervisors' networks and on social media forums such as Reddit. A particular effort was made to engage with Māori respondents and the recruitment message was modified to be culturally appropriate, whilst not inadvertently pre-priming on ethnicity. The study was approved by the University of Canterbury Human Ethics committee (HEC 2017/25) and although respondents were only made aware of the attitudes towards the Police research goals, they were fully debriefed on the ethnicity priming focus at the end of the study, at which point they had the option to withdraw their data. Only two potential respondents opted out of the study at this point.

For the first few weeks in which the survey was live, respondents were randomly assigned to one of the four voice conditions and were only placed in the text control if they could not hear the test audio at the start of the survey. This was because it was expected that it would be harder to encourage participants to complete a survey with the audio condition, which would take slightly longer than the reading condition. Once a sufficient number of respondents were assigned to the audio controls, recruitment focused on obtaining respondents for the text only control.

4.3 Perception of the speaker's ethnicity and gender: The scenario test

Although the results of the scenario test are not discussed in this thesis (given that focus is on voice activation of attitudes rather than cooperative behaviour, which is reserved for future research), the scenario is important in the context of the research because it is assumed that all respondents in the audio conditions would have perceived the speaker's ethnicity from the scenario test prior to commencement of the attitudinal task. Therefore, they are likely to have had a frame of reference in mind for the speaker, according to their own social experiences and it possible that it may prime a strong association between Māori ethnicity and crime. However, this is not seen as a limitation here because it would still achieve the aim of investigating the effect of voice on attitude behaviour; with the caveat that any results may be a result of pre-priming.

The respondents in the text condition were also asked to guess the ethnicity of the witness narrating the scenario, once they had completed the 20 statements, and were presented with the scenario once again as a reminder. The rationale for this was to observe whether those in the text condition had also potentially been primed by the concept of ethnicity prior to the commencement of the attitudinal survey and, if so, to determine whether such perception of ethnicity was in actual fact the predictor of the

attitude, rather than it being a feature of voice per-se. The perceived ethnicity guess of both the audio condition and text condition respondents were therefore combined into one variable for analysis, alongside a mode variable according to audio or text. If both perceived ethnicity and mode were significant, this would confirm voice activation would be a phenomenon in predicting the attitude(s).

In addition, those in the text condition were also asked to guess the likely gender of the witness and this likewise combined with the gender of the audio conditions (which was automatically assumed that participants would perceive correctly).

4.4 Measurements of attitudes from statements

Ten of these statements were selected from the 2015-2016⁵ New Zealand Police Citizen Satisfaction Survey (CSS) (Gravitas 2016) telephone questions and were transformed into statements. To control for survey acquiescence, some statements were negated. Given the emphasis in the literature on the effect of prior Police contact on attitudes towards the Police, the survey included a mix of global-level statements and encounter-specific statements. The assumption was that those who had not had recent contact would select the “neither agree nor disagree” option for these statements. Ten additional statements were taken from the focus group research on Māori attitudes towards the Police (Te Whaiti & Roguski, 1998) and Police attitudes towards Māori (Maxwell & Smith, 1998). The rationale behind this was to ensure there was an opportunity for respondents to assume an intra-group identity which may not have been prompted in the objective CSS statements. The focus group quotations were selected and adapted to represent the polar opposite of opinions (i.e. Police are negative towards Māori versus Police overcompensate in their approach towards Māori). It should be acknowledged therefore that the statement selection from the focus groups do not represent the full range of views expressed. Appendice 10.2 in the appendices provides the full list of statements as well as their originating source.

In order for the results to be directly comparable to previous NZ Police research, two of the questions from the CSS (Gravitas, 2016) were adapted into statements as baseline attitude measures:

1. I have trust and confidence in the New Zealand Police - for trust (Gravitas, 2016, p. 179)
2. I was treated fairly during my last contact with the Police - for fairness (Gravitas, 2016, p. 184)

As detailed in Section 3.1 of the literature review, this study also sought to analyse the effect of voice activation on attitudes in line with the procedural justice framework; in particular, the notions of motive-based and institutional trust, and distributional fairness (fair distribution of justice and services across the communities) (e.g. Tyler, 1987, 2001). These attitudes were construed from a selection of the total statements but the weighting of each attitude measured was not evenly balanced across the survey. This was not perceived as a limitation, given that the study does not necessarily seek to obtain an exact

⁵ The 2016-2017 survey (Gravitas, 2017) had not been released at the time of survey design.

measurement of each attitude but rather test the effect of perceived ethnicity or general mode of stimuli on various groups' responses across a range of attitudes.

The potential for each statement to measure a given attitude was checked for inter-rater reliability amongst both thesis supervisors and another colleague. Statements which did not receive a majority agreement or were deemed too pragmatically ambiguous in context of a given attitude were disqualified from constituting that attitude. For example, there was agreement that S16 (*"Police do not recognize that their approach in many situations is inappropriate and offensive"*) indicated a lack of trust in the motives of the Police but the statement was excluded from the analysis of Distributional fairness, due to the ambiguity as to whether it was suggesting negative intentions or ignorance of the Police officers. Given that the ethnic comparison within this study was between Māori and NZE groups, statements explicitly referring to relations between Māori and the Police were considered for assessment of perceived distributional fairness. However, in order to minimise ethnicity priming from the content of the statement itself, rather than the voice, the Māori explicit statements were kept to a minimum and were presented in randomised order.

Once the data was collected, respondent answers to a selected statement were scored on a scale of 0 to 4 with 2 always being assigned to neutral (neither agree nor disagree responses). This was dependent upon the polarity of the statement being either positively or negatively framed; if strong agreement indicated a higher level of supportive attitude to the Police, the respondent received 4 points towards the attitude and 0 points if they strongly disagreed and vice-versa for negative framing. The only exception to this was the general 'Agreement' attitude which was constructed for comparison to MacFarlane (2014). For this attitude, respondents received 4 points if they strongly agreed to the statement, regardless of its polarity framing.

The scores of each selected statements were then totalled to constitute a score for each attitude. These response variables were then assessed for reliability using Cronbach's alpha and statements were removed if it improved the reliability of the attitude grouping. When distinguishing between motive-based and institutional trust, a statement could only be in one trust measure or the other. In the instances that the majority vote led to a statement representing both trust measures, the deciding factor as to which attitude variable it would be assigned to was based upon removing it from the factor which would have the less impact on reducing the overall raw alpha. Given only a handful of statements reliably constituted institutional or motive-based trust, scores from both variables were also combined for an additional attitude response variable; an overall measure of trust.

4.5 Respondent demographics

Respondents were asked to provide the ethnicities in which they primarily identified with, recognising that a person's ethnic identity may cross between ethnic groups. However, in order to determine whether a potential effect of perceived ethnicity priming was due to alignment with a voice representing their intra-

group (or conversely divergence in an inter-group context), respondents could only be coded to one of either the Māori or NZE condition. Therefore, if the respondent indicated that they had any Māori ethnicity, they were classified within the Māori ethnic group, even if they also identified with other ethnicities such as Pasifika. The NZE respondent group also included respondents who indicated that they also identified with other ethnicities (excluding Māori) whereas anyone else was ethnically classified as “Other”. Whilst this may be considered an oversimplified approach, given that the sample of respondents who said they were of mixed ethnicity was proportionally small, any overall effect is likely to be representative of the group.

One’s level of alignment with a Māori identity was also considered as a separate predictor in a modified form of the Māori Integration Index (Szakay, 2007). This was calculated from eight questions within the demographic questionnaire (refer to appendices 10.3.9 and 10.3.10) for the questions and corresponding matrix), and allowed respondents to earn points on the MII even if their identity and their social circles were not exclusively Māori. When the revised MII index (with a maximum available score of 21 points) was compared to the original binary MII scoring system (maximum 14 points) (Szakay, 2007), on a sample of 40 survey responses, the difference between participants scoring was minimal; with the highest difference being an extra 3 points awarded in the revised version. Thus the study proceeded with the modified version, to recognise the non-binary reality of ethnicity.

As the literature review outlined, citizens’ satisfaction with, or lack of experience with the Police is expected to be a strong predictor for all attitudinal responses. Respondents were asked whether they had any contact with the Police in the 12 months prior to taking part in the survey and, if so, whether they were satisfied or dissatisfied with this contact. They were also asked whether they were a victim of crime; it was expected that this group would respond differently to those who said no, who were more likely to be witnesses or perpetrators, with the Police initiating the contact. This data is minimal in comparison to the demographics of the CSS - not asking for the crime type, for instance, however, this was purposely the case to ensure respondent anonymity amongst the small sample that was likely to be captured. This also meant that location data could not be expanded further than whether the respondent resided on the North or South Island.

Respondents were also asked what their preferred method of participation in police-related research would be. This was included to test whether there was an interaction effect with mode of stimuli on predicting Police attitudes, given that this may provide rationale behind voice activation (i.e. a person who prefers online surveys may be more likely to react to a voice in forming their opinion than someone who prefers the telephone interview). Furthermore, it would put into perspective the extent to which the findings can be compared to the CSS research; if most of the participants select “online survey”, which is to be expected given they have already agreed to participate in one, then the survey could represent views from a demographic sector that was missing from previous versions of the CSS (excluding the 2016-2017) report.

4.6 Controlling for voice attributes

Perceived friendliness and confidence were added as controls to establish whether any priming effects found could be attributed to speaker-specific voice attributes rather than perception of their membership to a group (ethnicity or gender). Again, this was based on the respondents' assessment of the speaker at the point of the scenario test, or the perceived witness in the text control condition. Likewise, these questions were asked on a five-point Likert scale (e.g. "very unfriendly" to "very friendly"). Given that respondents remained in the same voice condition throughout the experiment, it is assumed that their ratings of voice attributes would hold through to the statement section, the focus of this thesis. However, it was deemed more appropriate to ask respondents in context of the scenario, whereby the voice clearly represented one person rather than the statements which represented several viewpoints.

In addition to friendliness, the respondent was also asked to rate how educated they felt the speaker or the narrator (in the text-only condition) was, with levels ranging from no-education to post-graduate level education. Having a concrete scale which all respondents are most likely to be aware of arguably provides a reference point for a more reliable comparison than a rating of latent variables such as intelligence or competence traditionally invoked in perception studies. Given that the latter variables are stereotypically associated with formal levels of education, it is assumed that the present research will still be comparable.

The final attribute respondents were asked to rate the speakers on was for clarity. If the respondent did not find the voice clear enough to understand the full content, then their answers may have been primed due to the respondent's conscious awareness of poor recording or voice quality. This is just a precautionary measure, however, because given that the speakers were recorded within a specialised sound booth at the NZILBB, with high quality equipment (a Beyer microphone and a TASCAM), and were provided with several opportunities to repeat both the scenario and list of statements, it is expected that they should all be found to be 'clear' by the survey respondents.

4.7 Principle Component Analysis

To the author's knowledge, this study is the first exploratory analysis to consider the effect of voice activation on attitudes not directly attributed to social groupings or to the speaker themselves. Thus it was necessary to analyse more than one attitude; to establish whether voice activation could be found on specific attitudes towards the Police or whether it is an effect on a more global level, across attitudes generally. Whilst Tyler's concepts of Institutional and Motive based trust (Tyler, 2001, 2005) are clearly distinctive measures, applying these concepts to a measurable survey is arguably subjective. As human researchers, we are still subject to bias when selecting statements to represent these attitudes according to our own knowledge and experiences. Therefore, as well as revealing new potential groupings of statements, Principle Component Analysis was conducted, in line with Field et al., (2012) to validate the human-grouped attitudes. If the hypothesis of voice priming was supported and an attitude could be

predicted by the same effects by human and machine, then not only would the latent attitude measure be more robust but it would reveal more reliable results of the overall voice priming effect.

In order not to introduce any human bias in the selection of statements for PCA analysis, the individual scores were taken from the agreement variable, thus the scoring was consistent across positively and negatively framed statements. This polarity was automatically accounted for within each component loading, using keys in the reliability function of the psych package (Field et al., 2012). Statements 5, 9, 11, 15, 17 and 20 were removed from analysis due to having only one or zero correlation scores at 0.3 or above across the matrix. The 14 remaining statement variables achieved values in the Kaiser-Meyer-Olkin measure ranging between 0.87 and 0.97 KMO, with the overall KMO MSA of 0.93. As a result, there was high confidence that the sample size was appropriate for PCA analysis across these statements. Bartlett's test of sphericity $\chi^2(367) = 2274.778$, $p < .001$ confirmed it was suitable to proceed with PCA. Although the scree plot could have justified the extraction of three components, numerous over measures using the X package justified only two components. Given the prediction that attitudinal predictors would not be fully independent, the oblimin oblique method of rotation was chosen, retaining the default cut-off point to a 0.3 factor loading (Field et al., 2012). The factor loadings and Cronbach's α are shown in the appendices (10.2). The two distinctive components revealed by PCA were labelled as Police "Service" and "Discrimination and there was no overlap between statements with a factor loading in either component. However, statements that constituted both Institutional and Motive-based trust were distributed across both PCA components.

For the purposes of this thesis, a comparative analysis on the attitudes of trust and perceived fairness, only PCA component 2, discrimination will be analysed here, as a validation of any results found for perceived distributional fairness of the Police. Discrimination was very similar in composure to the distribution fairness, with the key distinction being that Police involvement in the local community did not load onto the discrimination component. Only one statement, S19, explicitly referring to Māori had a correlation score high enough to remain in the discrimination component.

4.8 Statistical methodology

Following standard sociolinguistic and psychological procedure, MacFarlane (2014) relied upon the use of a mixed effects logistic regression model when investigating the effect of voice priming on supportiveness across stimuli matched to the five societal groups, as described in the literature review. The attitude variables analysed here, however, were not binary responses but were rather numeric variables constituted from responses to a given number of statements, and each participant contributed only one score per response variable; as such, neither statement nor participant should be treated as random effects (Tagliamonte & Baayen, 2012). It was therefore more appropriate to use standard linear regression models, available through the lme4 package (Bates et al., 2016) in R (R Core Team, 2017). An assumption of the linear regression model is non-collinearity between the predictor variables. This assumption was checked for each model, using the function in package sj.Plot (Lüdtke, 2018), which

reported the variable inflation level for predictors and corresponding interactions; any that were rated above 'tolerable' were removed from the models.

There were several more predictors within the present study than in MacFarlane (2014), including the Māori Integration Index, which resulted in various different components being measured. Consequently, the chances of normal distribution across all categories was low. It was also expected that the overall number of responses (n) attained within the scope of this thesis would be smaller than the predictors (p). This commonly known $p > n$ issue is resolved by using non-parametric methods, which are also more appropriate for handling relationships between categorical variables (Strobl et al., 2009). This was an important implication given that ten of the predictors within this study were categorical and there was enough prior evidence from both the literature and Police statistics to suggest ethnicity would be associated with satisfaction in recent police contact and likelihood of being a victim of crime.

A statistical machine-learning approach known as the random forest available in R (R Core Team, 2017) through the package cForest (Hothorn et al., 2006; Strobl et al., 2008; Strobl et al., 2007) was a good candidate to handle data of this structure (Strobl et al. 2009). This analysis compares and collects votes from a vast number of regression "trees", whereby the branches recursively split according to the variables which are most strongly associated with the response variable, continuing until no more variables can be predictors at which point it reaches the nodes – "the leaves" (as described by Tagliamonte & Baayen, 2012), which in this case of this study are the mean averages of the response variable (Cutler, 2010).

A regression tree by itself is known to be unstable because one change at a node will impact the whole tree and therefore the more trees which vote for a predictor as being important, the more reliable the outcome (Strobl et al. 2009, p. 330). The random forest is the overall outcome when numerous trees are grown according only to a set number of random predictors from the whole set of predictors (refer to Strobl et al. 2009 for the precise statistical detail here). Although the number of trees ($ntree$) typically used in forests is 500, this takes significant computer processing power and, given the sample size obtained was relatively small and comparable to the number of predictors, 200 trees was deemed sufficient. There are various ways in which the optimal number of variables for random selection ($mtry$) can be set but the consensus appears to be to take the square root of the total number of predictors, thus the nearest number, 4 was chosen for 15 variables (V. Papp, personal communication, April 9, 2018).

The common practice visualization of the forest from this package is a plot of variable importance by permutation. This involves assessing the trees by removing each variable, in a similar manner to a step down process carried out in linear regression modelling, but this time removing those deemed by the tree to be highly associated with the response variable (Strobl et al., 2009, p. 335; Tagliamonte & Baayen, 2012, p. 160). Thus it compares a null hypothesis "baseline" to the perceived important model and assesses the difference in prediction accuracy (Strobl et al., 2009, p. 335; Tagliamonte & Baayen, 2012, p. 160). This method was chosen as opposed to the alternative bootstrapping methods available in other

packages which have been shown to be susceptible to bias where categorical predictors used in the forest have different numbers of levels (Strobl et al., 2008, p. 2), as is the case here.

As such, the outcome were graphs where variables are conveniently ranked on the x axis in descending order of importance in predicting the response. The plots across the graphs represented the magnitude of the role which that variable has in comparison to the other predictors i.e. the more to the right the plot is positioned on the graph, the higher the magnitude. All plots to the right of 0 were deemed to be significant, although if they are very close, it is of miniscule importance.

The key advantage of the Random forest approach is that it does not assume a strictly linear relationship but, as Strobl et al., (2009) inform, the “range of possible combinations includes all rectangular partitions that can be derived by means of recursive splitting—including multiple splits in the same variable” (2009, p. 325). Given prior research predicted very different responses within the split of the variable relating to the respondents’ previous experience with the Police (police contact), the Random forest approach seemed particularly appropriate. However, as discussed, there is a hypothesised linear prediction in this study, in that the more a respondent identifies with being Māori (as measured with the MII index), the less trust they will have in the Police and the more likely they are to perceive the Police as being less fair in their distribution of services than those with a lower MII index. Furthermore, linear interactions may be found where a respondent is more likely to trust the Police if they perceive the voice in the experiment to be friendly. As such, an exploratory analysis with both methods will be performed, following the example of Tagliamonte & Baayen (2012) who demonstrated how new insights can be gleaned, even on a well-known linguistic feature (the variation of was/were in York English) by using different statistical approaches.

The random forest’s capability to handle a large number of predictors (even when this is close to equalling the number of observations, as per this study) provides a useful tool to narrow down the predictors to a number that can be handled within a linear regression tool. Once the final random forest had been established for each response variable, all the predictors which were identified as important (i.e. above 0) were placed into a simple linear regression model accordingly. Insignificant variables were then removed on a step-down basis in order of least importance. The model which had the highest adjusted R square variance was considered the best fit, although the *F*-distribution statistic was also taken into account and, as is standard practice, if two models did not differ significantly, or this significant difference was small, the simplest model was deemed to fit the best.

Whilst this non-collinearity requirement is not assumed in the random forest approach, Strobl et al., (2008) advocate for the use of conditional variable importance measures to interpret the true effect of the predictor on the response variable.. They argue that variables which are only weakly associated with the response variables (i.e. are of “marginal importance”) may be selected as important because they show equal local splitting potential to the “true” predictor, as the latter does to the response variable (2008, p.

4). Although this parameter is available in the cForest package, this study was unable to make use of it, due to the extensive processing power required. However, a correlation matrix showed that there was very low correlation between the numeric predictor variables (age, MII total score and the voice rating attributes) – the highest correlation was between friendliness and clarity at 0.29, well below the de facto cut off point of 0.6. Given that prior knowledge can be used to expect some dependency between the categorical participant predictors of police contact and victim of crime, and the MII total score is dependent to some extent on the participant's ethnicity, the predictor from each of these paired variables, which received a lowest variable importance score from the initial Random Forest, was removed and a final random forest was then grown with the same *ntree* and *mtry* parameter settings.

As with Taglimonte and Baayen (2012), the regression model offered a complimentary yet alternative approach to investigating relationship between the response variables and the predictors, by providing insight into the direction in which a predictor can influence the level of response variable. Interactions between the predictor variables showing higher importance in the random forest were also tested within the linear regression models. However, given that the random forest does not assume a linear regression relationship, the results from each methodology should be interpreted as complimentary rather than as a complete explanation of variance.

4.9 Attitude and variables: a summary

Table 4-1: Summary of Attitude Response Variables, Voice Predictors and Demographic Factors

Attitude Response Variable	Description	Code name
Agreement	Overall participant agreement to statements on scale of 1-5 (strongly disagree to strongly agree) – regardless of statement positivity framing.	agreement
Baseline trust	Agreement on scale of 1-5 (strongly disagree to strongly agree) with the CSS statement: “I have trust and confidence in the New Zealand Police.”	agreementS7
Institutional trust	"Beliefs about the degree to which the Police are honest and care for the members of the communities they Police." (Tyler 2005) Related to the institution as a whole rather than the individual officers.	Rinstitutionaltrust
Motive-Based trust	At the individual level of the officer's intentions when dealing with the public and the faith that they "will respond to the needs and concerns of the public" (Tyler, 2005, p. 325). A sense that the Police and the public "are on the same side" Jackson and Bradford (2010)	Rmotivetrust
Combined trust	Combination of institutional and motive-based trust statements.	combinedtrust
Baseline fairness	Agreement on scale of 1-5 (strongly disagree to strongly agree) with the CSS statement: “I was treated fairly during my last contact with the police”	agreementS3
Distributional fairness	Higher scoring: perceive Police to distribute services/justice (more) fairly Lower scoring: perceive Police to distribute services/justice (more) unfairly	Rdisfair
Discrimination	Positive scoring: perceive Police to be (less) discriminatory Negative scoring: perceive Police to be discriminatory	TC2
Voice priming predictors		
Mode of stimuli	Audio or text	mode
Perceived ethnicity of stimuli	Māori, NZE or Other	ethnicityguesscomb
Gender of stimuli – perceived or actual	Male or female	StimuliGender
Clarity	Numeric factor 1 -very unclear	clarity

	2- unclear 3- neither clear not unclear 4- clear 5-very clear	
Friendliness	Numeric factor: 1 -very unfriendly 2- unfriendly 3- neither friendly not unfriendly 4- friendly 5-very friendly	friendliness
Confidence	Numeric factor 1 -very unconfident 2- unconfident 3- neither confident not unconfident 4- confident 5-very confident	confidence
Perceived education level of voice	Numeric factor: 1 – school or lower – post-school qualification 3 – university level and higher	v_educationnum
Demographic predictors		
Ethnicity	NZE, Māori or other	ethnicitycomb
Māori Integration Index (MII)	Scored based upon Māori-centred demographic questionnaire. Refer to appendix 10.3.10.	MIItotal
Recent police contact	Whether the respondent had contact with the Police within 12 months prior to taking the survey. Choice variable of “Yes- and I was satisfied”, “Yes - and I was dissatisfied” or “No.”	policecontact
Victim of crime	Whether the respondent had been a victim of crime within 12 months prior to taking the survey – not dependent on police contact.	victimcrime
Gender	Choice variable of male, female or gender diverse. Each were translated into te Reo, in line with Statistics New Zealand.	p_gender
Age	Choice variable for age range bracketed every ten years, starting from 18, with the oldest option being 60+	age
Island of residence	North or South	island
Preferred method of research	Online, telephone interview, face to face or non-preference.	prefresearch

5 Results

5.1 Participant distribution

A total of 367 survey responses were analysed in the current study. This was after the deletion of data from respondents who did not provide a response to all 20 statements and/or their ethnicity and/or their gender, which were required to perform a cross-group comparison

Table 5-1 details the number of participants in each condition by combined ethnicity (as defined in the methodology).

Table 5-1 Respondents by Ethnicity and Survey Condition

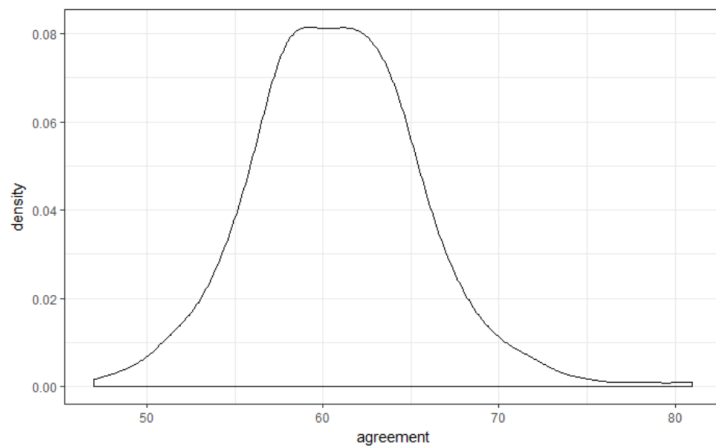
Condition	Respondent ethnic group					
	Māori		NZE		Other	
	<i>n</i>	%	<i>n</i>	%	N	%
Māori Female	11	17	41	15	10	26
Māori Male	11	17	42	15	2	5
NZE Female	11	17	44	16	6	15
NZE Male	16	25	45	17	9	23
Text	15	23	92	35	12	30
Total						
<i>n</i>	64		264		39	
% of data	17		72		11	

In order to construct a measurable baseline to test for survey acquiescence or inconsistency in attitude responses, an overall “agreement” measure was constructed, converting each respondents’ scores to numeric form (with 1 corresponding to “strongly disagree” through to 5 being “strongly agree”) regardless of the statement framing. Since approximately the same amount of statements were reverse scored in terms of positivity framing towards the Police, if the agreement data was not normally distributed, it would indicate unreliability with the responses calculated with the other attitude measures. However, as the descriptive statistics in table 5-2 and the density plot (Figure 5-1.1) below reveal, the overall agreement measure was near normal distribution. The fact that results are slightly positively skewed is consistent with the slight imbalance of positive/negative statements, as shown in appendix 10.2.

Table 5-2: Descriptive Statistics for Overall Respondent Agreement

Lowest score	Median	Mean	Highest score	Standard deviation	Interquartile range
47/100	61	60.79	81/100	4.77	6

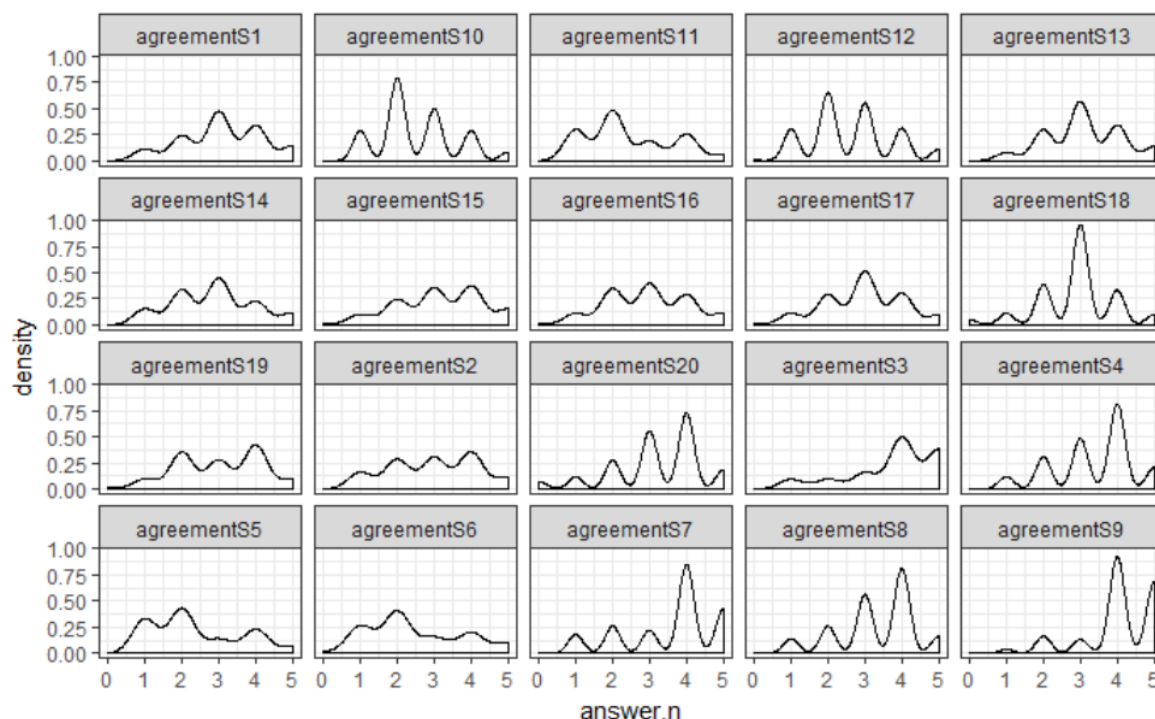
Figure 5.1-1: Density Plot of Overall Respondent Agreement to Statements



Four outlying respondents were found with an agreement score at 74 and above. However, when these respondents' answers to the individual statements were considered, none of them demonstrated behaviour of survey acquiescence in that they all disagreed with at least one statement. It was therefore decided to remove any outliers at the time of each regression model, using the functionality provided in the sj.Plot package which also provided an adjusted r^2 and Akaike information criterion (AIC) statistic on the updated model (Lüdecke, 2018).

The distribution of each individual statements can be seen from the faceted density plot (figure 5.1-2) below. The fact that most statements do not have identical distribution peaking at 3 (neither agree nor disagree) nor consistently show high peaks towards the end of the scale, is further indication that the level of survey acquiescence or outlying response behaviour is low.

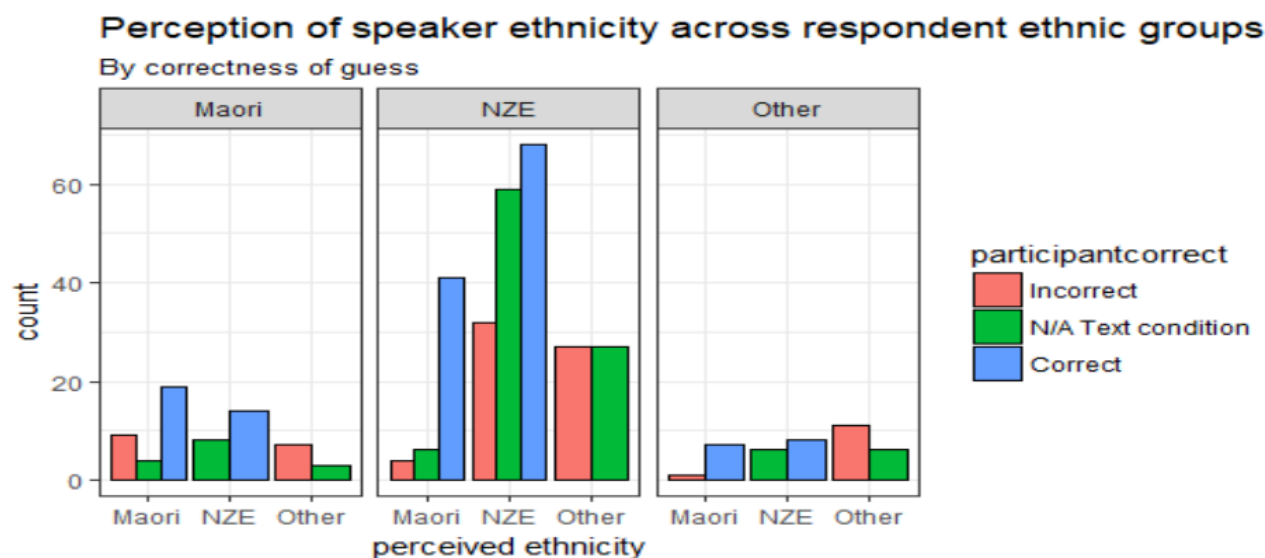
Figure 5.1-2 Density plot of answers per each individual statement, in numeric form



5.2 Perceiving ethnicity from voice

For the purposes of this thesis, the primary independent variable is the respondent's perception of the speaker's ethnicity. Although the actual ethnicity of the speaker was tested in the initial models, this appeared to have less significance than perceived ethnicity. Furthermore, whether the speaker was correct or not is not a requirement of voice priming (i.e. they may believe they are hearing a Māori speaker and so respond accordingly). Nonetheless, it is useful to review the proportion of respondents who were correct in their perception from the perspective of the familiarity hypotheses (refer to section 3.4 in the literature review). Figure 5.2-1 reveals that more respondents guessed correctly than not across each condition and both Māori and NZE ethnicity both guessed voices that corresponding to their own group correctly more than they guessed the other groups correctly. There was still a proportion of respondents amongst each ethnic group who either selected a different ethnicity or said that they could not guess an ethnicity. Those respondents of another ethnicity appeared to guess correctly more often than not.

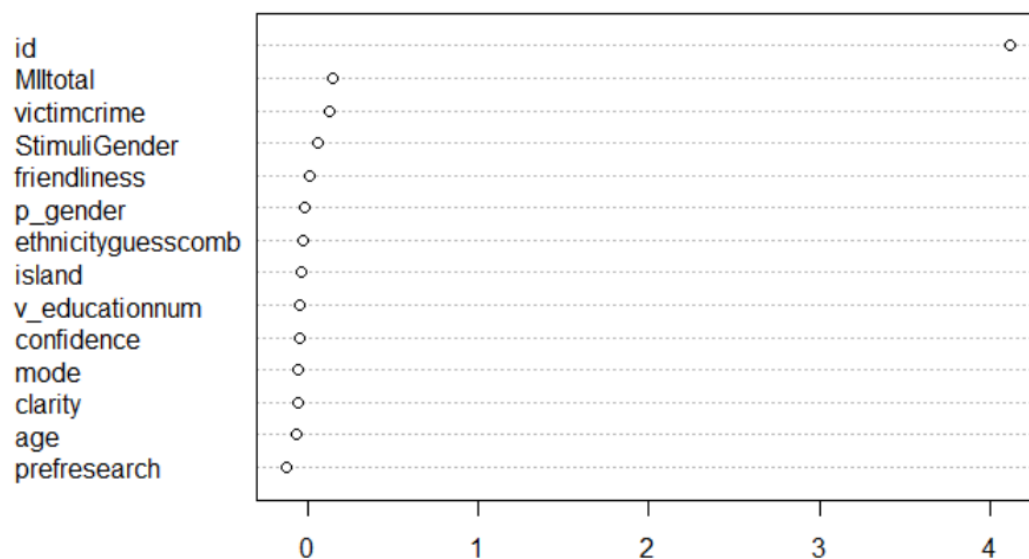
Figure 5.2-1 Bar Chart of the Frequency of Correct Ethnicity Perception across Respondent Ethnic Groups



5.3 Predicting general agreement

In line with Macfarlane's (2014) work, the first step was to assess whether priming had an impact on the likelihood of a respondent to agree or disagree with a statement, without the assumptions of what agreeing or disagreeing meant in terms of attitudes. A random forest was grown with the all the demographic and voice effect predictors in order to predict respondent overall agreement and, as can be seen from the x axis in Figure 5.3-1 below, the effect of individual variation (ID) was the most important variable with its importance score having a weighting of approximately four times that of any other variable,. There were only three variables that were found to be of any significance (past 0 on the x axis). The respondent's MII scores (MIItotal) were found to be the second most important predictor and their experience of being a victim of crime, the third. The perceived or actual gender of the stimuli revealed a miniscule importance of the effect of voice as the fourth factor, thus somewhat echoing MacFarlane's (2015) findings except for participant gender (p_gender) was not important.

Figure 5.3-1 Random Forest Variable Importance for Overall Respondent Agreement



However, when overall agreement was predicted in a linear regression model, it was revealed as an unreliable attitude measure, with the best fitted model only having an adjusted $r^2 = 0.03$ and $F(4, 362) = 4.039$, with no outliers detected. Nonetheless, this model found the top four predictors in the random forest as significant, as the coefficients for the regression model in table 5-3.1 show. Within this model, the intercept for comparison relates to a respondent with the lowest possible MII score of 0, who perceives the gender of the stimuli to be female and has not been a victim of crime.

The significance ($p = 0.004$) of the MII total having an estimated negative coefficient of -0.17 , indicates that those who were more integrated with Māori culture were more likely to disagree in general than those with lower scores. Those who were a victim of crime were estimated to having a higher agreement score of approximately 3 points ($p = 0.005$). In fact, victims of crime who perceived the stimuli to be male significantly ($p = 0.012$) agreed less by approximately 3 points, than victims of crime who perceived the stimuli to be female. However, these effects were clearly small when put into perspective that the total possible agreement points was 100 and the model appears to have a weak fit, with the adjusted r -squared accounting for only 3% variance in predicting respondent agreement. Furthermore, the reliability of both the independent stimuli gender coefficient and the coefficient for the interaction with victim of crime is questionable with the standard errors constituting 63% and 39% of the estimate respectively. Therefore, caution should be taken in interpreting the results as evidence of voice activation and the null hypothesis that survey responses reflect individual variance only cannot be disregarded based on agreement alone.

Table 5-3 1. Linear Regression coefficients for overall survey agreement

	Coefficients and standard errors
MII total	-0.174*** (0.060)
Stimuli Gender Male	0.886 (0.563)
Victim crime Y	2.706*** (0.965)
Stimuli Gender Male: Victim crime Y	-3.163** (1.246)
Intercept	61.014*** (0.548)
Observations	367
R ²	0.043
Adjusted R ²	0.032
Residual Std. Error	4.694 (df = 362)
F Statistic	4.039*** (df = 4; 362)
Note:	*p<0.05 **p<0.01 ***p<0.001

5.4 Overall Comparison with the Citizen Satisfaction Survey (2017)

As detailed in the methodology, two baseline attitude responses were measured, and the comparative results reveal a direct impact of overall voice priming on these statements. The following section provides a demographic comparison to the CSS data according to the measure of baseline trust “*I have trust and confidence in the New Zealand Police*” and baseline fairness “*I was treated fairly during my last contact with the Police*”. Descriptive statistics and visualisation of both measures then indicate that Māori report lower levels of trust and fairness, and they appear to be more susceptible to priming than respondents of NZE ethnicity. However, both random forest variable importance and linear regression reveal that the respondents’ previous experience with the Police outweighs any other effect. Only the linear regression models reveal influence of the mode of stimuli whereas the random forests do not predict priming on baseline attitudes as important.

5.5 Baseline trust and fairness overview

Table 5-4 below compares the percentage distribution of respondents’ agreement to statements in accordance with the values measured in the Citizen Satisfaction Survey (CSS). As with the CSS, most respondents in this survey agree with the statement that they have trust and confidence in the police, which is indicated by the mean 3.6 and median 4 (where 5=“strongly agree”). However, respondents in this study were more likely to express lack of trust and confidence than the CSS, confirmed by the Median Absolute Deviation (MAD) of 1, which is more appropriate descriptive statistic for the multimodal distribution of this response data.

Table 5-4 Summary Comparison with Citizen Satisfaction Report “Trust and Confidence and Police Role” – in % (adapted from Gravitas, 2017, p.

Satisfaction value (as per CSS)	CSS (2017) <i>Total positive</i>	This study <i>Strongly agree/ Agree/</i>	CSS (2017) <i>Neutral/Some trust and confidence</i>	This study <i>Neither agree nor disagree</i>	CSS (2017) <i>Total negative</i>	This study <i>Disagree, Strongly Disagree</i>
Trust & Confidence	77	66	17	11	6	22

In terms of fairness, a direct comparison cannot be made given this study covers a recent contact period of 12 months, in comparison to 6 within the CSS (Gravitas, 2017, p. 3). However, a stronger weighting of negativity within the current study was also found for this measure, as displayed in 5-5.

Table 5-5 Baseline Fairness Distribution by Recent Police Contact – Comparison with Statistics Adapted from CSS (Gravitas, 2017, p. 58)

Answer	Respondents' satisfaction of recent contact with police				Total % of respondents with recent contact	CSS (2016-2017) %
	<i>Satisfied</i>		<i>Dissatisfied</i>			
	<i>n</i>	%	<i>n</i>	%		
Strongly disagree	0	0	20	29	8	2
Disagree	2	1	17	25	8	3
Neither agree nor disagree	9	5	11	16	8	4
Agree	79	46	18	26	40	38
Strongly agree	82	48	3	4	35	51
Total	172		69		99	98

5.6 Baseline trust and fairness visualisation by ethnicity

Although the CSS did not publish raw statistics on a comparison of trust by ethnicity, it states that “respondents significantly more likely to give a rating of full/quite a lot of trust and confidence” included those... of European ethnicity (81%, compared with 68% of all other respondents)” (Gravitas, 2017, p. 12). On the other hand, those of “of ‘other’, Pacific, Māori, or Asian ethnicity” were most likely to provide negative responses (Gravitas, 2017, p. 12), with the percentage of Māori reporting “not much/no trust and confidence” being 8%. Similarly, the CSS does not differentiate between ethnic groups specifically to the fairness statement, rather it is grouped as an attribute of “Police service” of which Europeans were more likely to report a positive experience than Māori (and Pacific ethnicity) (Gravitas, 2017, p.6). A direct comparison also cannot be made with regards to European ethnicity in the CSS, as Europeans not necessarily of New Zealand descent were included within this group, whereas the equivalent group in this survey only included New Zealanders. This may account for why those of “Other” ethnicity in this survey had the highest overall level of agreement. It is striking that all ethnic groups report over double the level of disagreement than the 8% quoted for Māori in the CSS. However, there is still a higher proportion of mistrust in the Police amongst the Māori respondents; here the combined disagreement is 29%.

Boxplots (Figures 5.5-1 and 5.5-2) were drawn to visualise levels of baseline trust and fairness, respectively, by ethnicity and island of residence. The range of responses is clearly greater for NZE respondents across both measures and it is apparent that there was a greater frequency of lower trust scores received from NZE respondents in the North Island. However, there appears to be more NZE respondents who strongly disagree that they were treated fairly, across both islands. Nonetheless, all

three ethnic groups have the same median level of 4 for both measures of trust and fairness, which suggests that there is no significant intergroup variation. Thus, there is a consensus of agreement amongst respondents perceiving that they personally received fair treatment and that they have trust and confidence in the New Zealand Police in general. However, respondents of an ethnicity other than Māori or NZE ethnicity had an upper range in strongly agreeing with this statement (5). The range of responses to this statement was clearly greater for Māori than NZE respondents, with the former group having a lower quartile of 2 (disagree) and were the only group whose minimum value of 1 (strongly disagree) was not considered an outlier.

Figure 5.6-1 Boxplot of Levels of Baseline Trust across Respondent Groups, by Island of Residence

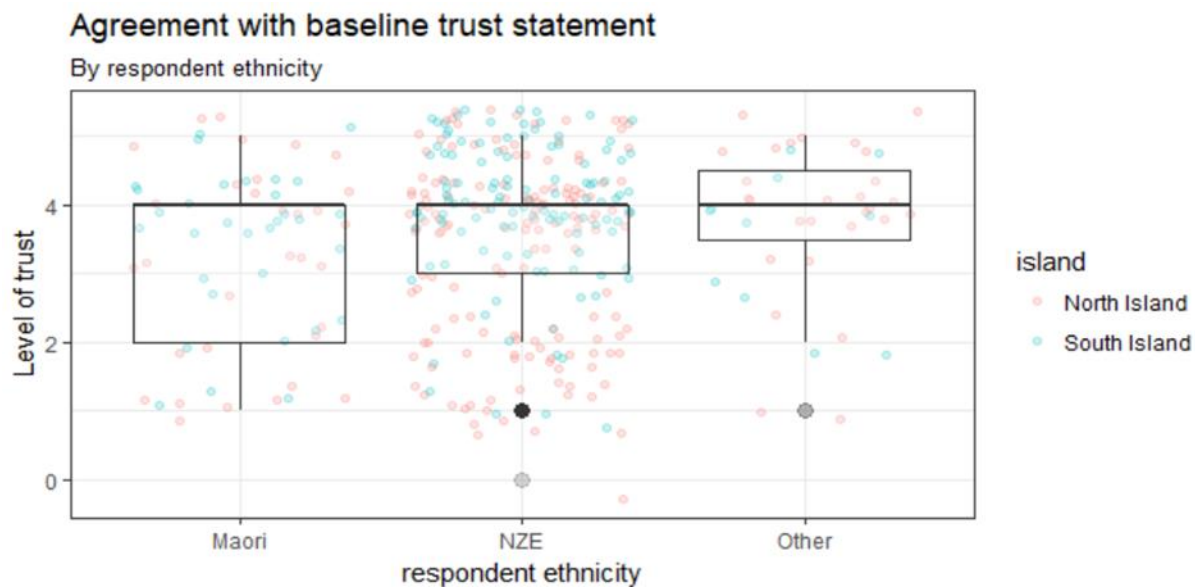
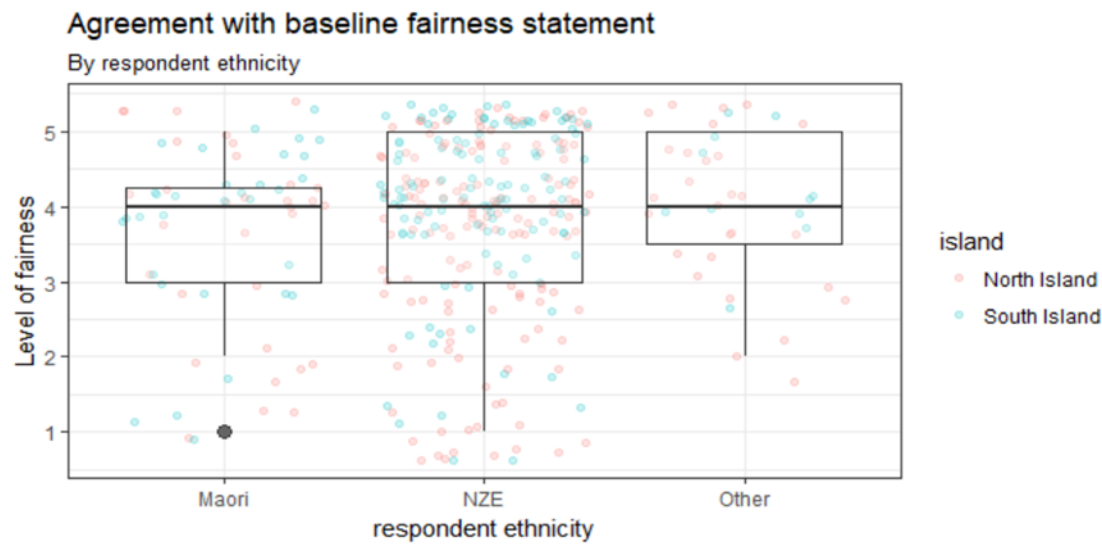


Figure 5.6-2 Boxplot of Levels of Baseline Fairness across Respondent Groups, by Island of Residence



5.7 Baseline trust and fairness: Visualising priming

As outlined in section 3.3 of the literature review, in order to investigate whether the perceived ethnicity of a speaker can predict the respondent's attitude, it first needs to be established whether the effect of voice overall can predict variation in attitudes, in comparison to a text baseline. Therefore, before the statistical methods were applied, the average results of baseline trust and fairness for each ethnic group were plotted according to the mode of stimuli.

Whilst all medians are the same across ethnic groups for baseline fairness, the median score for baseline trust is lowest for Māori (the mid-range of neither agreeing nor disagreeing) in the text condition, as shown in boxplot 5.6-1. However, their trust levels were on par with NZE respondents in the audio condition. Although all groups appear to have a higher range of baseline trust responses if they were assigned to the text condition, Māori were also the group who varied the most in agreement with this statement in this condition. This effect was replicated for baseline fairness, as shown in boxplot 5.6-2.

Figure 5.7-1 Boxplot of the Distribution of Baseline Trust Scores across Ethnic Groups, according to the Mode of Stimuli

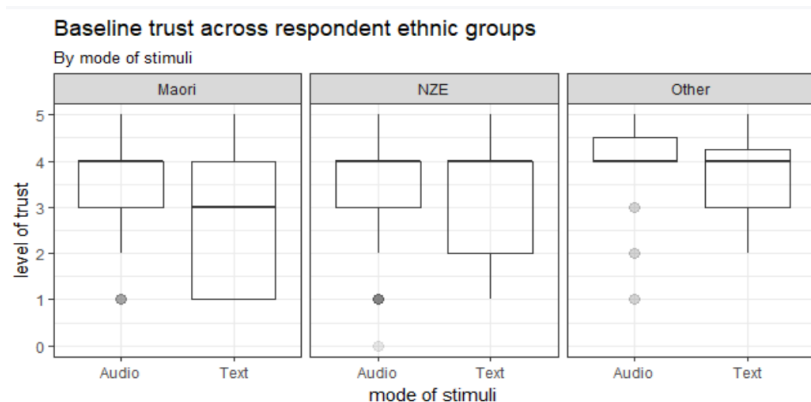
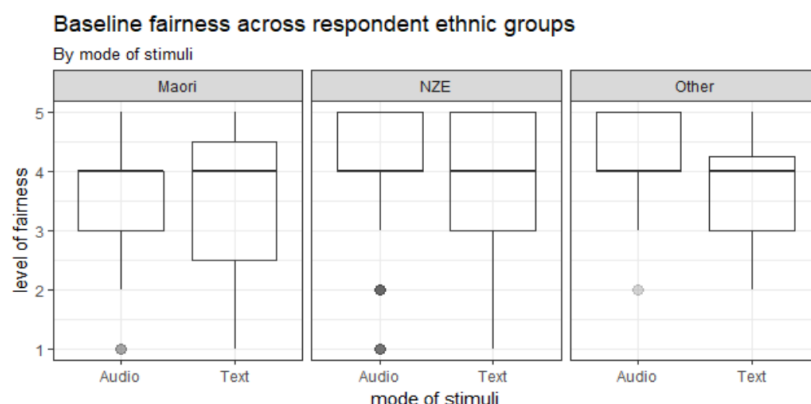
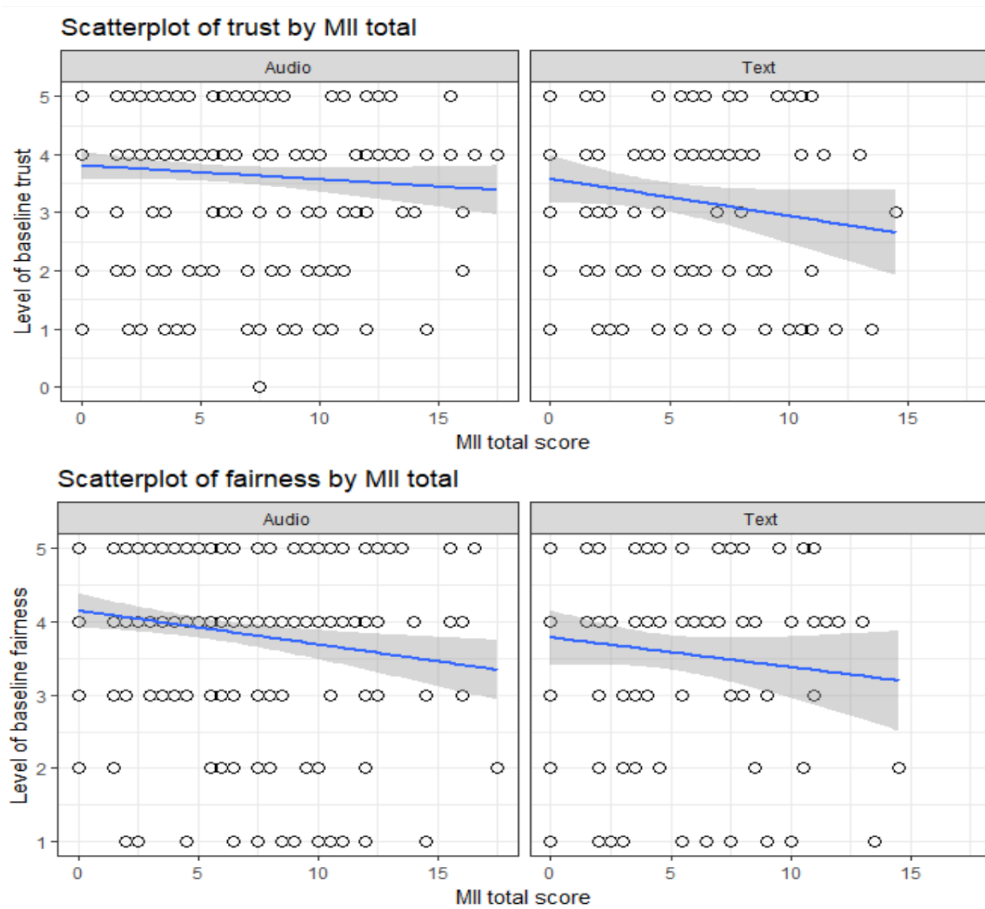


Figure 5.7-2 Boxplot of the Distribution of Baseline Fairness Scores across Ethnic Groups, according to the Mode of Stimuli



The boxplot for baseline trust in particular shows initial evidence that voice priming may have been present for Māori respondents. The MII total was also tested as a predictor of trust, as Figure 5.6 3 shows in the scatter plot by regression lines, according to the mode of stimuli. Whilst neither slope is particularly steep, it is clear that MII score negatively correlates with the level of trust reported, more so in the text control condition. Therefore, this suggests that Māori were more susceptible to the effect of voice activation for the reporting of trust. In contrast, the MII regression is parallel across both modes of stimuli for baseline fairness. Yet, as levels of perceived fairness of treatment in their recent Police contact decrease the more the respondent is integrated in Māori culture, regardless of the mode of stimuli.

Figure 5.7-3 Scatterplots of Baseline Trust and Fairness by MII Score, Grouped by Mode of Stimuli



The next step, therefore, was to investigate whether Māori were reporting higher levels of trust according to the perceived ethnicity of the voice. Therefore, levels of baseline trust and fairness according to perceived ethnicity of the stimuli were plotted for each respondent ethnic group. For baseline trust, as Figure 5.7-4 reveals, once again, it was only Māori respondents whom differed in median across the perceived ethnic groups. Conversely to hypothesis H13, where Māori were predictively to only report higher levels of trust in a Māori condition, Māori respondents reported higher levels of trust when they perceived the speaker to be of NZE ethnicity. However, as predicted by H13, Māori scores did reveal a negative bias in that Māori respondents were more likely to disagree when they perceived the ethnicity as any other than NZE, including their own intra-group. This may suggest an element of self-presentation towards the Māori speaker, reinforcing intra-group solidarity with more stereotypical view of less trust in the Police, in the same manner as was found by Williams et al., (2008) . Yet, there did not appear to be strong agreement amongst Māori respondents for baseline fairness across the perceived ethnicity conditions, as shown in Figure 5.7-5.

Despite having the same median across all three perceived ethnicities, New Zealanders of European descent appeared more often to disagree with baseline trust when they perceived the voice as being

“other” which may indicate intergroup ‘New Zealander’ solidarity, inclusive of Māori, in line with the findings reported by Sibley & Liu (2007). The results for speakers of “Other” ethnicity appear too sporadic for baseline trust in comparison to fairness and as such will not be discussed here.

Figure 5.7-4 Box plot of Baseline Trust across Perceived Ethnicity Conditions, by Respondent Ethnicity

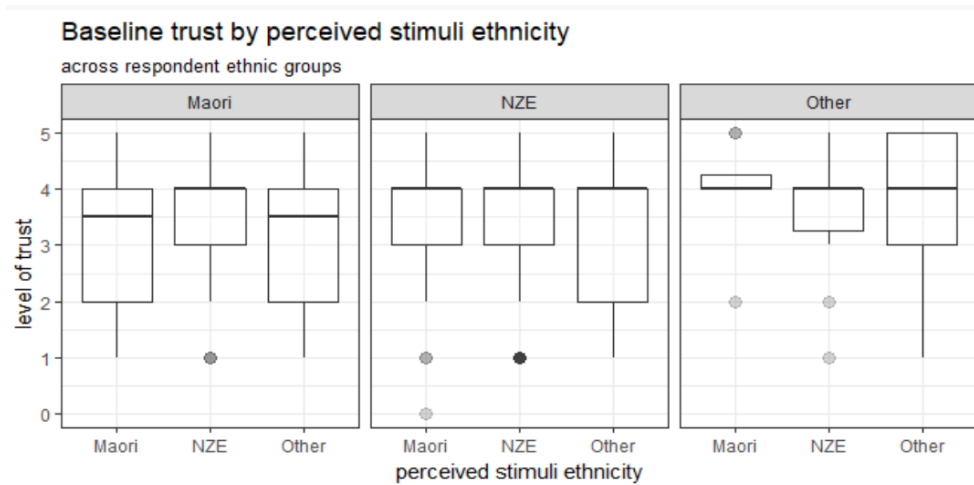
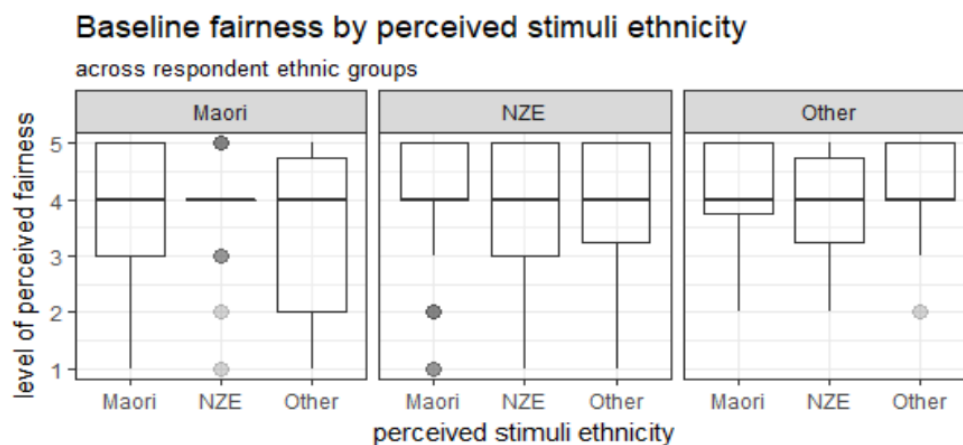


Figure 5.7-5 Box plot of Baseline Fairness across Perceived Ethnicity Conditions, by Respondent Ethnicity



5.8 Baseline trust and fairness: Random forest and variable importance

The visualisations so far indicate that Māori were the most affected by voice priming, both according to the overall mode and the perceived ethnicity of the speaker/text author, whereas there is minimal priming for NZE respondents. This may be associated with Māori respondents being more likely to disagree with this statement in general. However, these visualisations and descriptive statistics are based upon averages and, given that the distribution of the data for both baseline trust and fairness is multimodal these visualisations may be misleading. Therefore, the next step of using non-parametric method of random forests/variable importance is likely to be a more reliable for both baseline measures. Self-reported ethnicity was outranked by its potential collinear pair of MII total (as described in Methodology

section 4.8) and so was removed from the forest for baseline trust, whilst the reverse was true for baseline fairness. The forests for baseline trust (Figure 5.8-1) and fairness (Figure 5.8-2) are shown in below.

Figure 5.8-1 Variable Importance as per the Random Forest for Baseline Trust

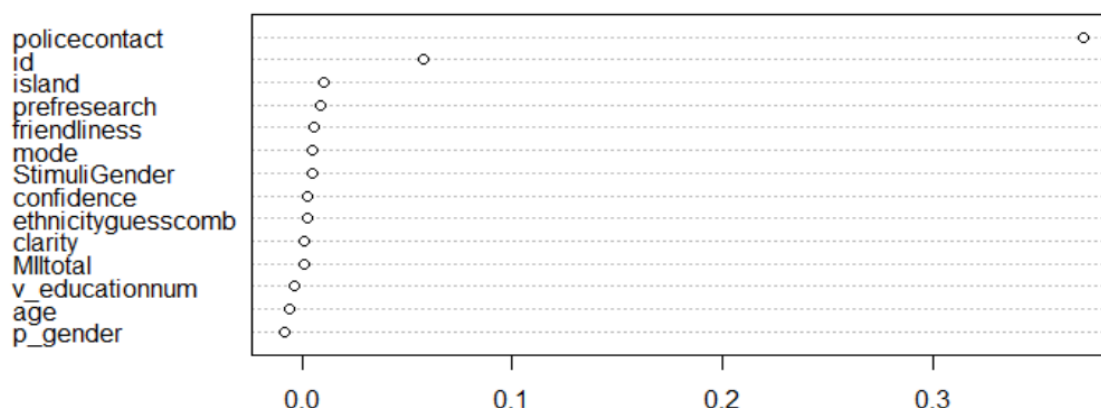
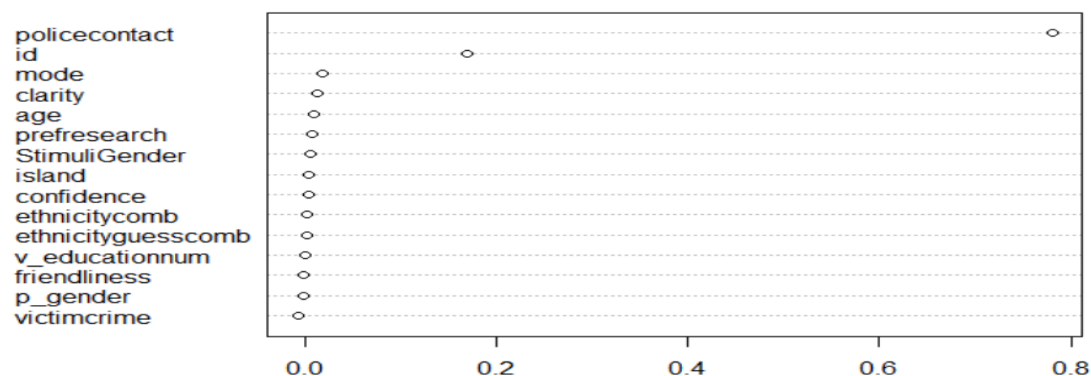


Figure 5.8-2 Variable Importance as per the Random Forest for Baseline Fairness



The respondents' recent (or lack of) experience with the Police is the predictor with the most importance in both forests, approximately three-four times more weighting in variable importance than individual variation, the second predictor (as can be determined by plots among the y axis). For fairness, mode of stimuli is the third most important (albeit minimally), whereas for baseline trust the voice attribute of friendliness, ranked in fifth position, just outperforms the mode. This suggests that there may be a statistical relationship between priming predictors and level of trust but its importance in comparison to police contact and individual variation is minimal.

5.9 Baseline Trust and fairness: Linear regression models

In order to evaluate the direction of and potential interaction between the predictors, linear regression models were fitted, with baseline trust and baseline fairness scores as the outcome. As described above the results from this should be interpreted with caution, given the non-normal distribution of data.

The coefficients and standard errors of the significant variables are detailed in Table 5-6, alongside the model fit. The intercept for both models describes an individual who has not had Police contact, resides in the North Island, has a MII total of 0 and was assigned to an audio condition. In both models the estimate is between 3-4, which corresponds to answering either “neither agree or disagree” or “agree” to these statements. This model suggests that the significance of the respondents’ prior police contact in predicting trust, as shown in the random forest, may in fact be linear. Not surprisingly, the effect of participants being dissatisfied with recent police contact significantly reduces the report of trust ($p < 0.001$) whilst being satisfied with recent police contact significantly increases their level of trust ($p < 0.01$), but to a much smaller extent. The effect of voice was found to be significant through the mode of stimuli in predicting baseline where those in the text condition were significantly more ($p < 0.01$) likely to report lower levels of trust than those in the audio condition. The effect of voice was not significant in predicting baseline fairness and therefore was not entered into the final model.

Each response attitude was also predicted by a demographic independent variable; respondents residing in the South Island significantly reported higher levels of trust than those respondents in the North Island, whilst those with a higher MII score were significantly likely to report lower levels of perceived fairness of treatment. As the MII regression plot (Figure 5.9-1) illustrated, the respondents’ MII score did not interact with the mode of stimuli for predicting fairness, yet the variation in steepness of MII regression across the two modes for baseline trust, which had indicated an interaction, was also insignificant.

Although by explaining 31% and 36% of the variance these models are stronger than that for the agreement variable, in comparison to the coefficient for dissatisfied respondents, the reliability for all other coefficients is still questionable; for instance the value of the standard error for mode accounts to 47% of the coefficient.

Table 5-6: Linear Regression Coefficients and Standard Errors for Baseline trust and Baseline fairness

	Dependent variable:	
	Baseline trust	Baseline fairness
	(1)	(2)
Intercept	3.619*** (0.113)	3.834*** (0.100)
Contact DS	-1.424*** (0.156)	-1.076*** (0.144)
Contact S	0.287** (0.123)	0.785*** (0.113)
Island South	0.334*** (0.111)	
Mode Text	-0.247** (0.117)	
MII total		-0.038*** (0.012)
Observations	367	367
R ²	0.310	0.362
Adjusted R ²	0.302	0.356
Residual Std. Error	1.038 (df = 362)	0.950 (df = 363)
F Statistic	40.646*** (df = 4; 362)	68.556*** (df = 3; 363)
Note:	*p**p***p<0.01	

5.10 Voice activation and the Procedural Justice framework

As discussed in methodology, this study analysed attitudes towards the Police in accordance with the Procedural Justice Framework: motive-based trust, institutional trust and distributional fairness (Jackson & Bradford, 2010b; Tyler, 2001, 2005). Given that only a handful of statements could be reliably grouped using Cronbach's alpha, an overall trust measure combining both institutional and motive-based trust was also analysed. Fairness was also validated using Principle Component Analysis (refer to section 4.7 in the methodology), which created an additional response variable that constituted a discrimination element from the statements. None of the measures contained the baseline trust or fairness statements analysed in the previous section.

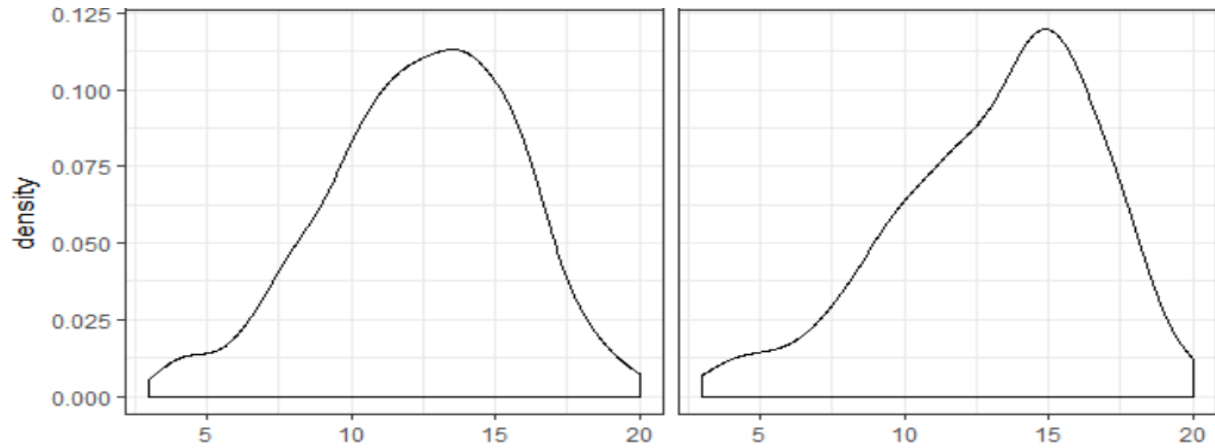
Table 5-7 below provides descriptive distribution statistics as appropriate for each of the five response variables; either standard deviation for those variables with a near normal distribution or the inter-quartile range and the median absolute deviation value for non-normally distributed data. The distribution for each response variable is visualised in Figure 5.10-1.

Table 5-7 Descriptive statistics for measures of procedural justice

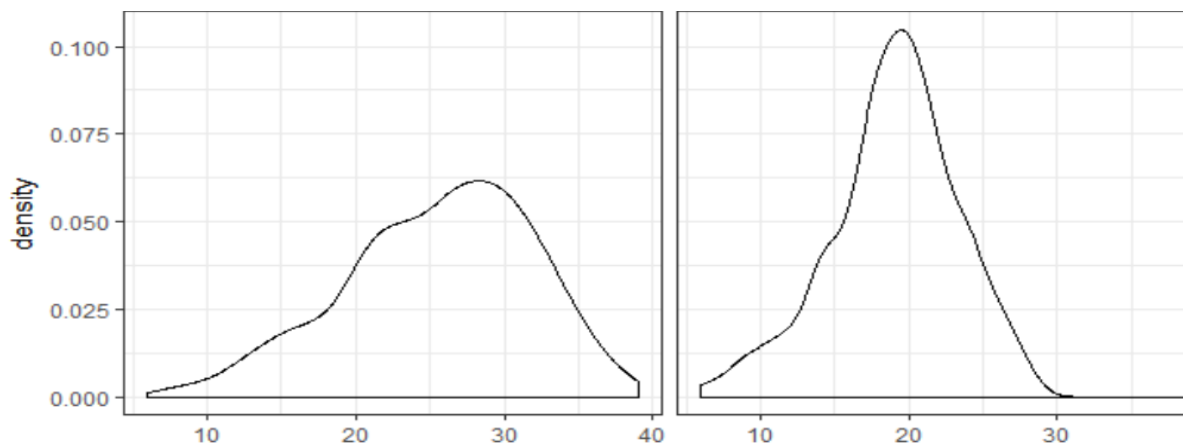
Trust measure	Lowest value	Median	Mean	Highest score	SD	IQR	MAD
Motive based trust	3/20	14	13.19	20/20	-	5	2
Institutional trust	4/20	13	12.41	20/20	3.3	-	-
Combined trust	7/40	26	25.6	39/40	-	9	4
Distributional fairness	6/30	19	19	28/30	4.3	-	-
Discrimination (PCA score)	-2.858	0.078	0	2.40	-	1.277	0.95

Figure 5.10-1 Density Plots for each Response Variable in Accordance with the Procedural Justice Framework

Density plot for Institutional Trust (left) and Motive-based trust (right)



Density plot for Combined trust (left) and Distributional Fairness (right)



Density plot for Discrimination (constructed with Principle Component Analysis)



The measure of institutional trust was the most normally distributed of the response variables and thus was predicted to be the most reliable response variable for the parametric linear regression model. Distributional fairness had a near normal distribution, with a slight positive skew. In comparison, the combined trust measure was negatively skewed and slightly multimodal, and thus predicted that the non-parametric random forest would reveal the more reliable results for this measure. Similarly, motive based trust was not multimodal but was negatively skewed, as was the discrimination variable. This principle component factor score for participants was more difficult to interpret but the negative values corresponded to agreement towards statements which suggested that the Police are discriminatory in their treatment of citizens (not necessarily intentionally) whilst a positive value related to respondents perceiving the Police to be indiscriminate according to race and/or ethnicity. Thus all boxplots for scores on this component can be interpreted in a similar manner to the distributional fairness response variable.

From these statistics, it can be inferred that the average respondent ranged from neither trusting nor distrusting to having some level of trust in the Police across all three trust measures. Each measure had respondents at both extremes of the trust scale and the dispersed spread of data was wide across the scale; with the normally distributed Institutional trust, 95% of the respondents had trust scores between 5.81 to 19.01 whilst the IQR for the non-normally distributed variables represents distribution equivalent to ~25% of the scoring scale. Thus, it was expected that individual variance would have a strong effect in the exploratory analysis. The similarity of statistics across all the trust variables suggested that there would not be an identifiable difference between the respondents' level of motive based trust and institutional trust. Respondents seemed to score slightly higher scores on average for fairness and the discrimination component.

5.11 Visualising the overall effect of voice on attitudes

Given the mode of stimuli was found to be significant for Māori respondents, with those in the text condition reporting slightly lower levels of trust, it was expected that this result would be replicated across the three measures of trust and therefore provide evidence that the voice condition effect was not due to an effect of any specific statement. In contrast, the baseline fairness did not reveal an effect of voice activation. This was expected direction considering that the measure relates to personal evaluations on how fairly a respondent perceived they were treated and thus a person is less likely to rely upon the linguistic cues in a voice to guide their opinion. However, it was hypothesised that distributional fairness would be more susceptible to voice activation because it relates to one's perception of how the Police distribute fair treatment across groups. Consequently, it was expected that respondents would draw more upon the linguistic cues to guide their formation of an opinion that may not have been personally relevant to them. In addition, the content of the statements that constituted distributional trust were expected to

invoke a stronger association between the topic and the perceived ethnicity of the Māori speakers in particular.

Therefore, boxplots were drawn for all five response variables across respondent ethnic group and mode of stimuli, as shown in Figures 5.11-1 to 5.11-5. From this point forward, all visualisations will focus only on a comparison between the Māori and NZE ethnic group because the data was too sparse for respondents of any other ethnicity.

Figure 5.11-1 Levels of motive-based trust across respondent groups by mode of stimuli

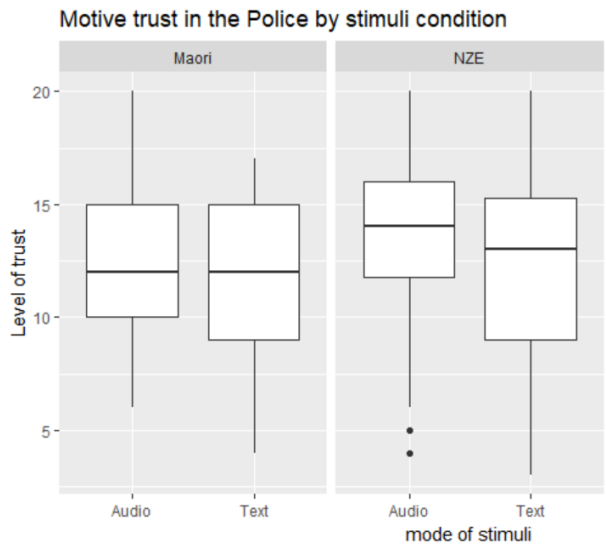


Figure 5.11-2 Levels of institutional-based trust across respondent groups by mode of stimuli

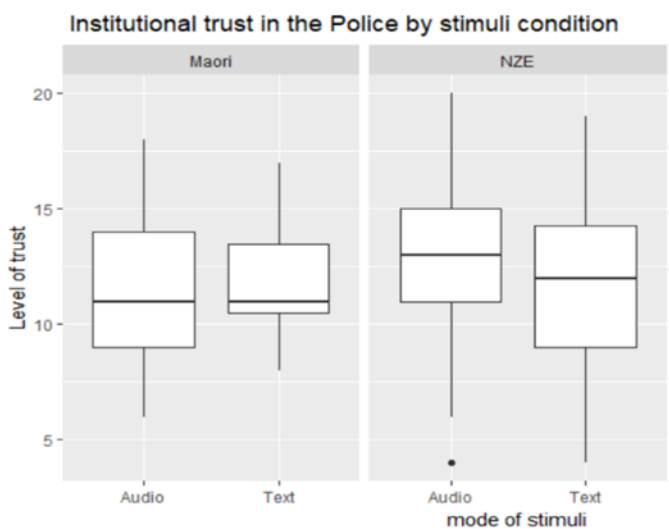


Figure 5.11-3 Levels of overall trust across respondent groups by mode of stimuli

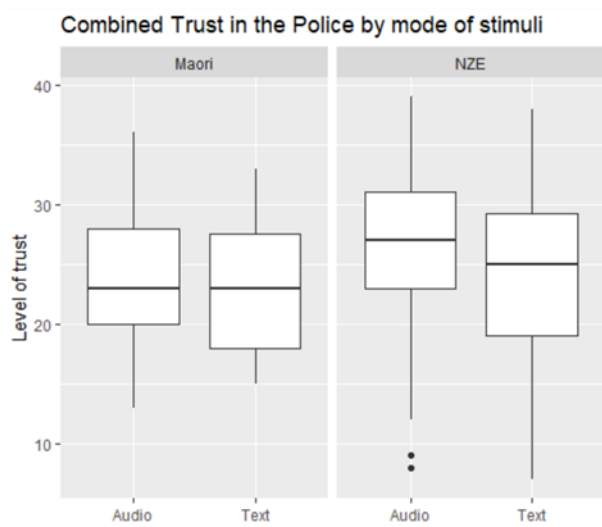


Figure 5.11-4 Level of perceived distributional fairness across respondent groups by mode of stimuli

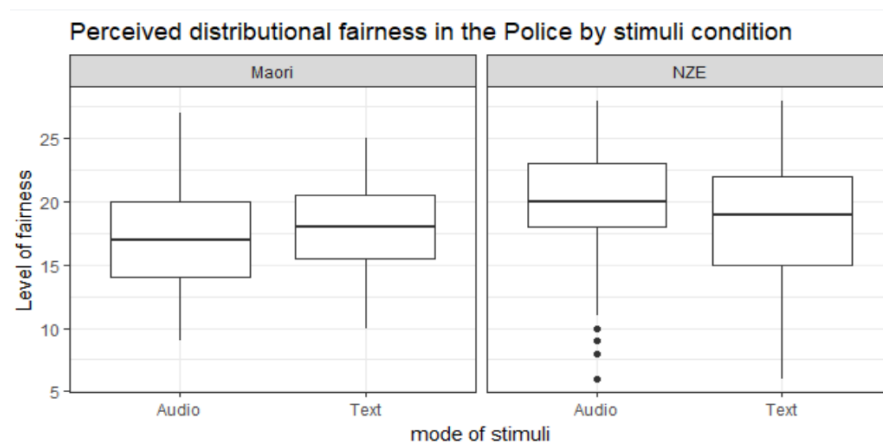
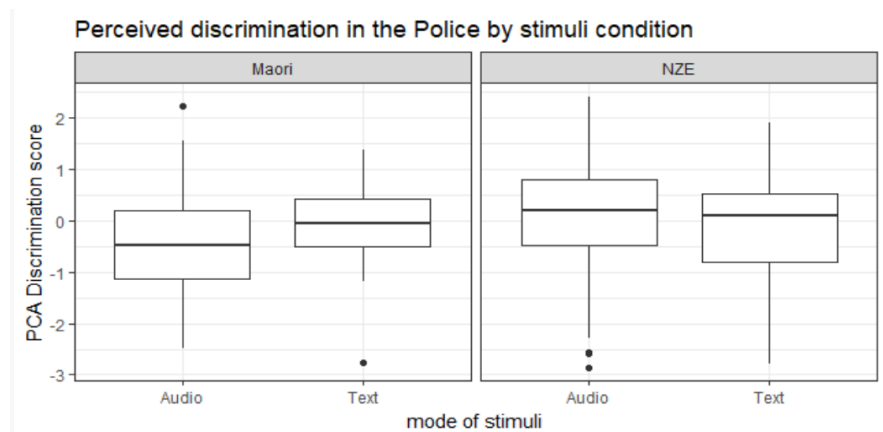


Figure 5.11-5 Figure 5.11-6 PCA discrimination component score across respondent groups by mode of stimuli



Although median levels of reported trust for Māori are still lower than that of NZ Europeans for all measures of trust - and fairness to a smaller degree - the boxplots now indicate that the greatest difference when comparing Māori and NZE trust levels in mode conditions is within the NZE group. This group consistently reported higher trust levels fairness attitudes when in an audio condition than in a text condition. Therefore the mode of stimuli was found to affect trust levels of both ethnic groups in the same manner with the voice stimuli activating more positive responses for all trust measures than the text stimuli – albeit to a smaller extent for Māori than was indicated in the baseline trust measure. This suggested that there would not be a significant interaction between mode of stimuli and respondent ethnicity for trust. Yet, for perceived fairness and discrimination, Māori respondents provided more neutral scores in the text condition, and the least positive scores = in the audio condition, contrary to the findings for the baseline fairness measure. Thus, this further indicated that voice activation may be linked to the associated strength between the stimuli and the response variable with voice reaffirming attitudes stereotypical to their ethnic group (i.e. Māori stereotypically have a lower perception of overall distributive fairness of justice and perceive the Police to be more discriminatory than Pākehā stereotypically do). This effect of voice activation was also alluded to in the visualisation of institutional trust whereby, although the medians were the same for both conditions, there were more Māori respondents with a lower level of trust in the audio condition for than in the text condition. Again, institutional trust is an abstraction that is arguably more associated with one’s identity in a social context than personal interactions with the Police force, which contribute instead to motive-based trust.

5.12 Ethnicity priming visualisation

Given that respondents of both ethnicities appeared to respond to the trust and fairness in the stereotypical direction when they were in the audio condition rather than in the text condition, this suggested there would be voice activation specifically in relation to perceived ethnicity. Thus boxplots (Figures 5.12-1 to 5.12-5) were drawn comparing respondent ethnicities according to their perceptions of the stimuli ethnicity.

Figure 5.12-1 Boxplot showing Levels of Institutional Trust across Respondent Ethnic Groups, by Perceived Ethnicity of Stimuli

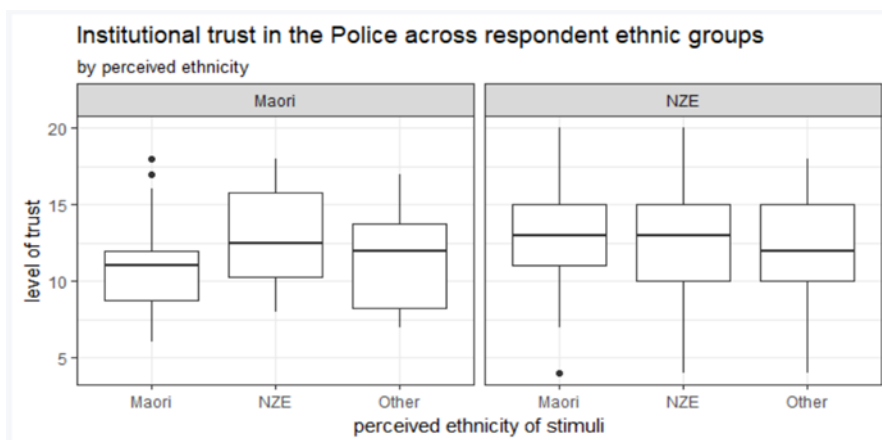


Figure 5.12-2 Boxplot showing Levels of Motive-based Trust across Respondent Ethnic Groups, by Perceived Ethnicity of Stimuli

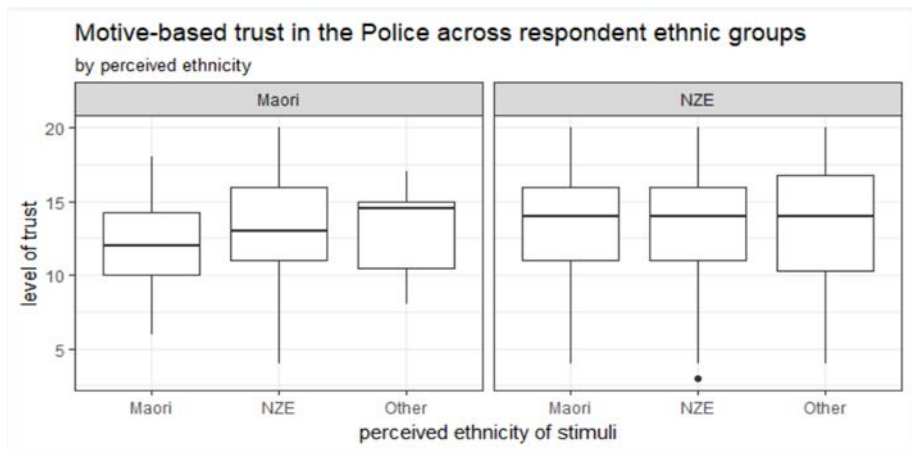


Figure 5.12-3 Boxplot showing Levels of Combined Trust across Respondent Ethnic Groups, by Perceived Ethnicity of Stimuli

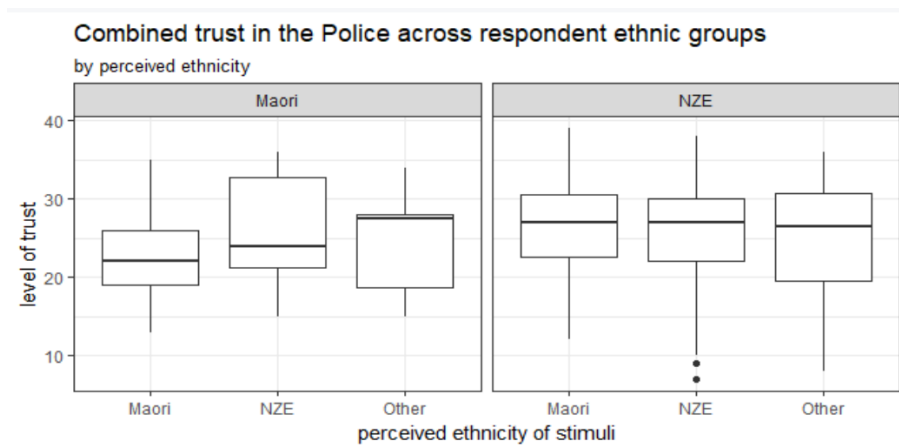


Figure 5.12-4 Boxplot showing Levels of Perceived Distributional Fairness across Respondent Ethnic Groups, by Perceived Ethnicity of Stimuli

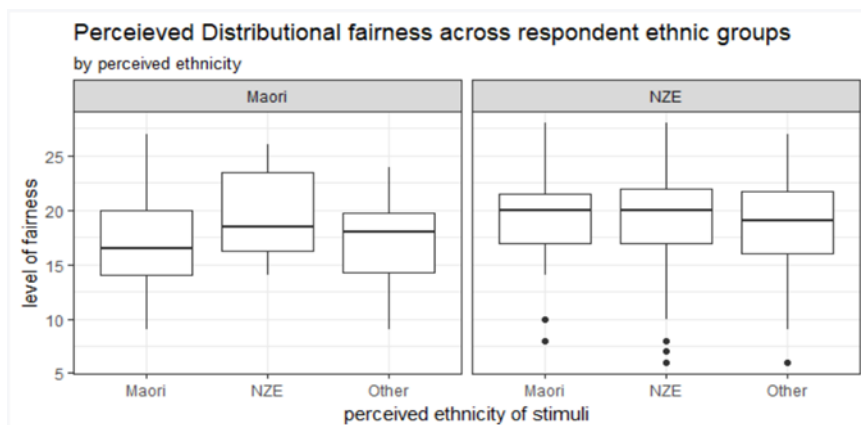
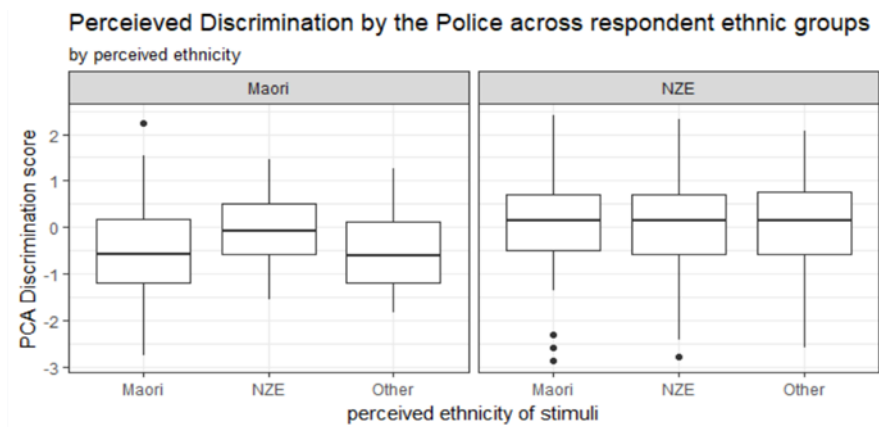


Figure 5.12-5 Boxplot showing PCA Discrimination Component Scores across Respondent Ethnic Groups, by Perceived Ethnicity of Stimuli



The median level of trust for Māori respondents was consistently lower when they perceive themselves to be in a Māori condition (i.e. the condition ethnicity and the participant are congruent). The frequency of higher trust scores for Māori perceiving the stimuli condition to be of NZE ethnicity was consistent across all trust and fairness measures, although the median for motive-based trust was higher when they perceived the ethnicity to be anything other than NZE or Māori. Additionally, when Māori perceived they were in an in-group condition, they provided lower scores across the trust and fairness attitudes. However, the overall negative score, when Māori respondent ethnicity was congruent with perceived Māori ethnicity for the discrimination PCA component, which indicated that they perceived the Police to more discriminatory than not, was equal to the PCA score for Māori respondents who perceived the ethnicity to be any other than NZE or Māori. In other words, the PCA discrimination score for Māori respondents appeared only to be neutral when they perceived the ethnicity of the speaker to be NZE, the ethnicity of the majority group. This supports the complex association predicted in section 4.3 of the literature review; respondents may have been indexing their ethnic identity by perceiving the institution of the Police as an entity separate from their group, which may have been a notion of common ground (c.f. Croft, 2009) amongst the Māori community by virtue of group experience with the Police. In particular, they seem to identify amongst a larger minority group whom they perceive is not being served fairly by the institution as a whole in relation to the majority group.

In contrast, there was a null-effect of perceived ethnicity for NZE respondents, as observed in the visualisation of the trust-baseline, and this was apparent across all trust measures (with the exception of "other" ethnicity for the perception of institutional trust). This was striking in comparison to Māori respondents and suggested that rather than perceived ethnicity, NZE respondents may have been primed by the effect of voice overall in comparison to text. This would support the literature on familiarity (review to section 4.1) and cognitive accessibility suggesting that the unfamiliar text condition prompted more deliberation than a voice. If this was the case, it would also provide an indication of the power of priming

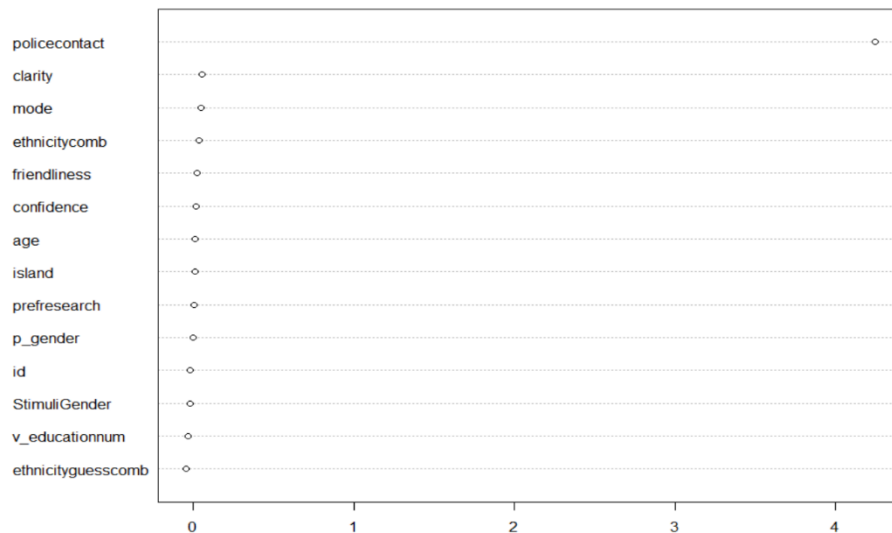
by perceived ethnicity, given that Māori converged with the stereotypical attitudes of speakers from both ethnicities.

Of course, this visualisation does not reveal whether these effects are significant, nor does it establish whether there were any other effects related to voices which prompted the NZE speakers to converge towards overall. It also does not confirm their importance of the voice activation effects, if they are indeed significant. Therefore the analysis will now turn to random forests and linear regression models for each of the trust and fairness measures, as per the baseline response variables.

5.13 Trust and fairness: Random forest and variable importance

The variable importance plots from the random forests for the procedural trust and fairness attitudes are shown below.

Figure 5.13-1 Variable Importance Plot from the Random Forest Predicting Motive-based Trust across All Respondents



Firstly, it can be seen that the only important predictor for motive-based trust is the respondent's recent experience with the Police, which has a importance weighting of over four times that of all other predictors; this was the case for the baseline trust and fairness measures and holds across all other attitudes constituted in line with the procedural justice framework. Although some priming was apparent for this trust measure on the boxplots for mode of stimuli and perceived ethnicity, the variation appeared smaller than for the institutional trust measure and so the null importance results for these predictors was unsurprising. However, the boxplots showed more variation for the measure of institutional trust and so it was expected that the random forests would show some level of importance for the mode of stimuli in this measure. On the contrary, mode of stimuli was ordered of lower importance than in the motive-based measure. The variation of attitude strength between Māori and NZE respondents was, however, ranked

as important as the second predictor, in the form of the Māori Integration Index. When the trust measures were combined, mode was ranked as the third most important predictor but the respondents' prior police contact was still the prominent predictor, weighting approximately 10 times the importance of mode

Figure 5.13-2 Variable Importance Plot from the Random Forest Predicting Institutional Trust across All Respondents

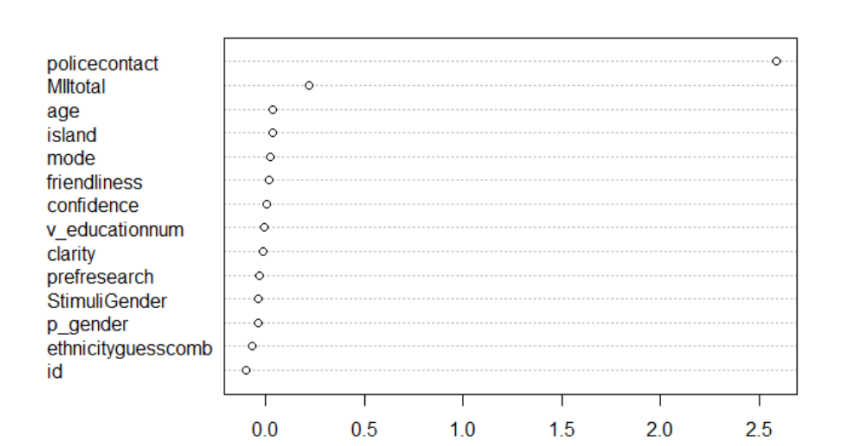
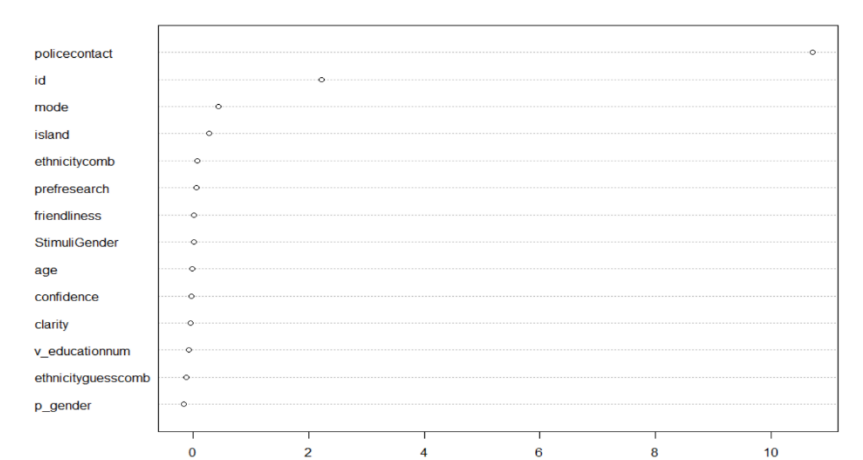
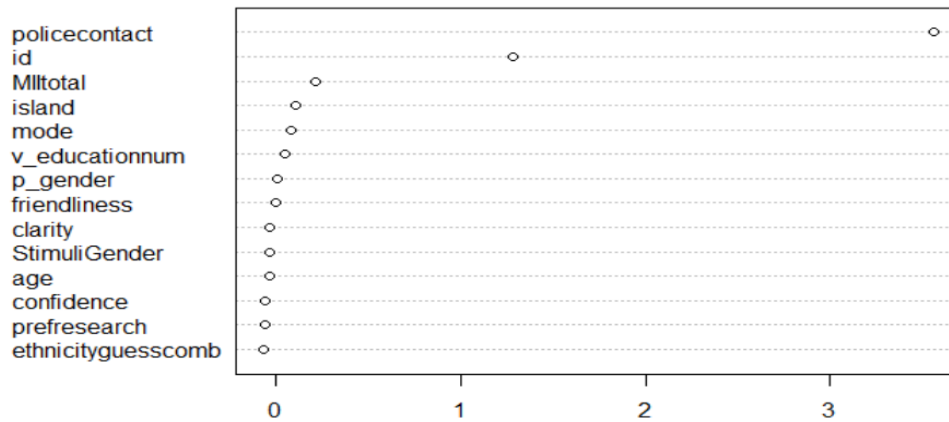


Figure 5.13-3 Variable Importance Plot from the Random Forest Predicting Combined Trust across All Respondents



The ranking of importance for perceived distributional fairness followed a similar pattern to institutional trust, with the exception of individual variation, which was perceived as the second most important variable after Police contact. The three recurrent variables of MII score, island of residence and mode of stimuli were rated as having importance but again this was miniscule.

Figure 5.13-4 Variable Importance Plot from the Random Forest Predicting Distributional Fairness across All Respondents



The most unexpected finding gleaned from the random forests after the visualisation of data by perceived ethnicity was that this variable was ranked as the least important predictor across all procedural justice attitudes of trust and fairness. Also unexpected was the fact that out of all the attitude measures, perceived ethnicity ranked amongst the lowest predictors for institutional trust. However, the mode of stimuli was consistently found in the top five important variables, amongst the three consistent demographic variables of police contact, MII total, island of residence; the same variables of importance for the baseline trust and fairness measures. The next step, therefore, was to perform linear regression models for each attitude to test whether these were significant in the same manner as the equivalent baseline measures.

5.14 Trust and fairness: Linear regression models

The coefficients and standard errors of the significant variables for procedural justice attitudes are detailed in 5-8 alongside the model fit data. The intercept is set to the same levels as the baseline attitudes relating to a respondent with no recent Police contact, with a MII score of 0, who has been assigned to an audio condition and resides in the North Island.

Table 5-8 Linear Regression Coefficients for Predicting Attitudes in line with the Procedural Justice framework

	<i>Dependent variable:</i>				
	Combined trust	Motive-based trust	Institutional trust	Distributional fairness	Discrimination (PCA)
	(1)	(2)	(3)	(4)	(5)
Intercept	27.187*** (0.793)	13.383*** (0.278)	12.916*** (0.327)	20.099*** (0.442)	0.258* (0.143)
Contact DS	-7.120*** (1.273)	-4.052*** (0.422)	-3.355*** (0.435)	-3.929*** (0.576)	-0.602*** (0.144)
Contact S	1.073 (0.949)	1.684*** (0.332)	0.786** (0.341)	1.172*** (0.452)	0.144 (0.113)
MII total	-0.285** (0.123)		-0.095** (0.037)	-0.119** (0.050)	-0.040*** (0.013)
Mode: Text	-1.313** (0.567)	-0.687** (0.317)		-0.849** (0.429)	
Island: South	1.075** (0.538)		0.624** (0.304)		
Contact DS: MII total	0.013 (0.188)				
Contact S: MII total	0.270* (0.153)				
Observations	367	367	367	367	367
R ²	0.381	0.371	0.253	0.222	0.116
Adjusted R ²	0.369	0.365	0.245	0.214	0.101
Residual Std. Error	4.984 (df = 359)	2.821 (df = 363)	2.868 (df = 362)	3.801 (df = 362)	0.948 (df = 360)
F Statistic	31.560*** (df = 7; 359)	71.254*** (df = 3; 363)	30.672*** (df = 4; 362)	25.888*** (df = 4; 362)	7.880*** (df = 6; 360)
<i>Note:</i>					*p**p***p<0.01

Consistent with the baseline trust and fairness models, and the random forests, respondents' previous experience with the Police is the most important predictor across the attitude variables. The coefficient comparing dissatisfied respondents to those with no prior contact was also the most significant at $p > 0.001$, with the smallest standard errors in relation to the estimates.

Institutional trust was clearly the most ill-fitting model of all trust response variables, with an adjusted r^2 accounting only for 25% of the variation. As with the random forest, mode of stimuli was not found to be significant for this measure whereas it was for motive based trust and combined trust. In addition, the

combined trust variable revealed that Island was again found significant at $p < 0.05$, with the South Island respondents having a higher level of trust than North Islanders. The effect of those in the text condition reporting lower levels of trust than those in the audio is slightly smaller than the baseline trust effect measure by approximately 3%. This response variable also revealed the only significant ($p < 0.05$) interaction across attitudes, with an increase of MII total predicting higher levels of trust for respondents who were satisfied with their previous contact with the Police.

Both the fairness and PCA component of discrimination had the lowest fitting statistics within the attitudes. As with motive-based trust, the mode of stimuli was significant for distributional fairness but also had a relatively large standard error relating to approximately half the coefficient estimate, whilst the mode of stimuli was not found as significant in predicting the PCA component score. In fact, the model for this discrimination component only accounting for 10% of the variance. Without investigating the specific effects of the statements which constituted the composition of the PCA component (which is outside of the scope of this thesis), an explanation cannot be provided for the discrepancy between the fit of this model in comparison to distributional fairness. The respondents' MII score was a highly significant factor ($p < 0.001$) in predicting the discrimination component score, indicating that as one became more affiliated with Māori culture, they perceived the Police to be more discriminating. Yet, again this effect was small, equating to a decrease of 1.7% of the highest discrimination value. However, the small effect size of the MII index was also found in the more robust combined trust measure, where MII was independently found to decrease the level of trust in the Police (as MII increased) to a small extent of 1.3% of the maximum MII values. Thus, whilst there was an effect of respondent ethnicity on the procedural justice attitudes, as with the baseline measures this effect was small in relation to the variation within the data.

Both the random forest and linear regression models indicated that the respondents' recent contact (if any) with the Police was the overall most important predictor in their level of trust in, and perceived fairness of the Police, with the negative weighting of the dissatisfied respondents being the most significant in comparison to those without any prior contact in the Police. This partially addressed Research Question Three in establishing the likelihood of voice activation in context of other predictors, however it also revealed that voice activation may occur to varying extents dependent upon the respondent's previous experience with the Police. Therefore, the next focus of the discussion is to explore the effect of voice activation across levels of Police contact.

5.17 Voice activation and the importance of prior Police contact

When the three levels of police contact, mode and island were visualized in a boxplot (Figure 5.17-1) according to combined trust, the effect of mode was greater for those respondents who were dissatisfied (Y_DS) with their recent Police contact (a total of 69 respondents). Out of these respondents, 28 said they have been a victim within the last 12 months and 17 of those left a comment at the end of the survey. Whilst these comments did not always relate to their experiences, those which did provided details about being victims of house burglaries, theft of valuable possessions and of gun crime. Although within this survey whether or not the respondent initiated the contact with the Police was not captured, it can be presumed that those who were victims of crime were likely to have initiated the contact.

The 69 responses from dissatisfied respondents were analysed separately next. The island of residence appeared to interact with the mode of stimuli for the North Island (with a total number of 45 dissatisfied respondents), where levels of reported trust were much lower in the text condition than in an audio condition. Conversely, those in the South Island (a total number of 24 dissatisfied respondents) reported higher levels of trust when in an audio condition. When dissatisfied respondents' level of combined trust was plotted according to respondent ethnicity and perceived ethnicity, in order to test whether there was an effect of voice activation within this data subset, the relationship was less clear, as shown in Figure 5.17-2. There was less variation for dissatisfied Māori respondents, aside from the higher levels of trust reported in a NZE condition, consistent with the effect for Māori overall (section 5.12). However, NZE dissatisfied respondents generally gave higher trust scores when in the audio conditions except for when they perceived the voice ethnicity to be of an ethnicity other than Māori or NZE. Accordingly, dissatisfied NZE respondents who perceived another ethnicity in the text condition reported greater levels of trust. Therefore, there is clearly a complex relationship between the demographic variables of respondent ethnicity and Island of residence, alongside the predictors of voice activation, mode of stimuli and perceived ethnicity of stimuli.

Figure 5.17-1 Boxplot of Combined Trust in the Police Reported by Respondents across the Two Islands, According to Recent Police Contact

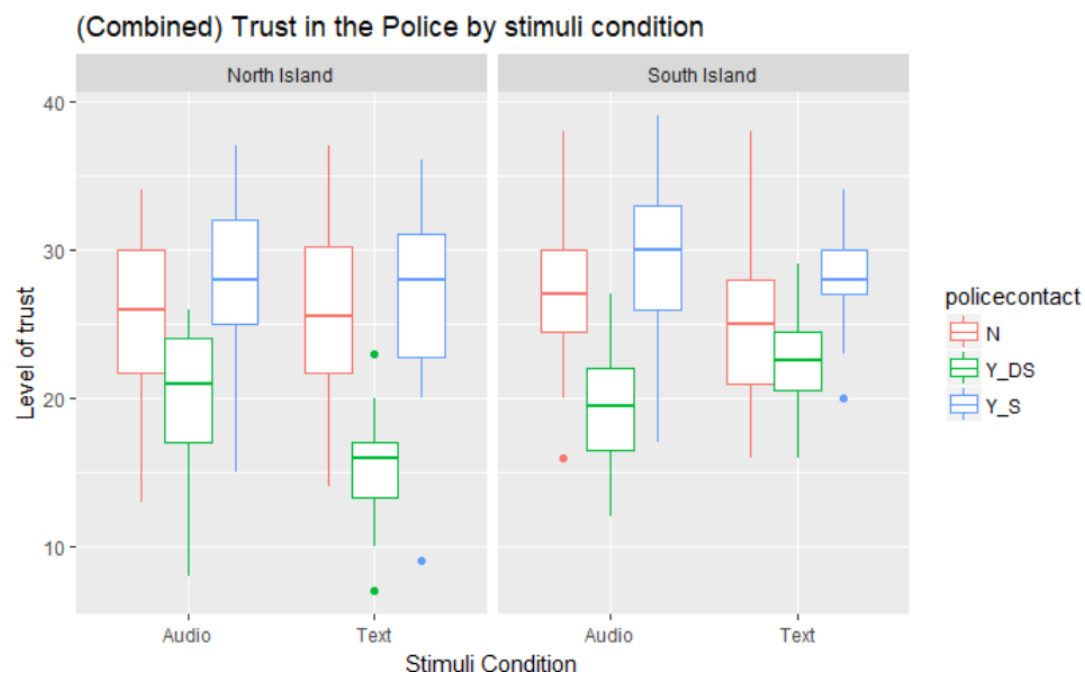
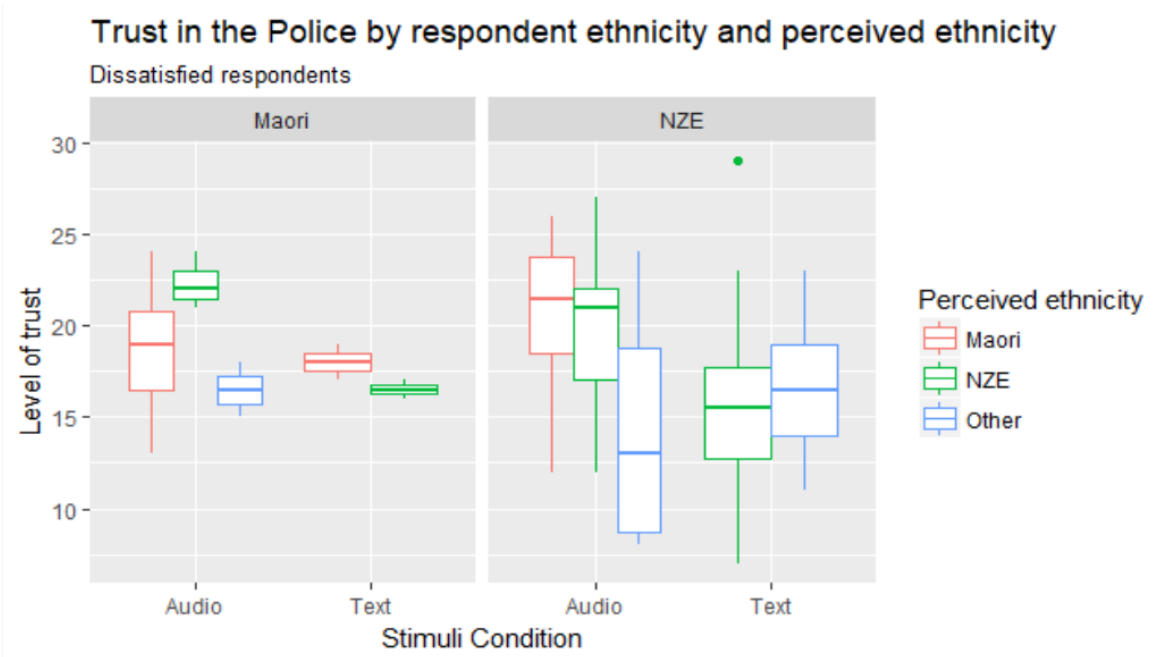


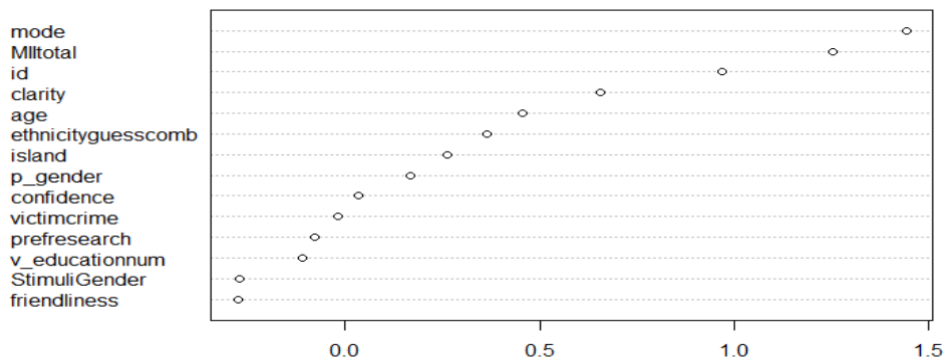
Figure 5.17-2 Boxplot of Combined Trust in the Police according to Dissatisfied Respondents' Ethnicity and Perceived Ethnicity of the Speaker



5.18 Dissatisfied respondents: Random forests

A random forest was grown with all the potential predictors on this subset of data, and in contrast to the forest for the whole dataset, it was found that dissatisfied respondents' MII total score was of higher importance than their self-reported ethnicity. Therefore, ethnicity was consequently removed from the random forest, due to potential collinearity and the variable importance plot is shown in Figure 5.18-1 below:

Figure 5.18-1 Variable Importance plot of Combined Trust for Dissatisfied Respondents



The distribution of factor importance is clearly much wider once the effect of Police contact has been removed. Furthermore, the mode of stimuli has now become the most important factor in predicting combined trust, closely followed by MII total. These are of greater importance to dissatisfied respondents than the individual variation, thus supporting the conclusion that voice activation has a greater impact within groups of respondents than across the whole sample.

Random forests were then grown for the dissatisfied respondents according to the other response variables within the Procedural Justice framework. The forest result for motive-based trust was near identical to that of the macro trust variable, however, the analysis of Institutional trust revealed markedly different variable importance. Whilst MII total was found to be the most important predictor, the respondents' guess of the stimuli ethnicity was a more important predictor than the mode of stimuli, although both had some level of importance. The perceived ethnicity of voice was ranked as somewhat important in the random forest for dissatisfied respondent but the mode of the stimuli was ranked as the third most important variable, whilst MII total ranked as the most important predictor after individual variation.

The potential of voice activation occurring as a consequence of perceived ethnicity is apparent for the first time in the random forests for the dissatisfied respondents, where perceived ethnicity has previously been ranked an unimportant predictor across the whole dataset. However, all attitudes ranked clarity of voice as important, within position of the top four. This could, therefore potentially suggest that speakers of a given ethnicity were perceived to be clearer than the other group and thus activated a particular result in

the audio condition, in comparison to text. Nevertheless, any such direction could not be confirmed in the random forests.

Figure 5.18-2 Variable Importance plot of Institutional Trust for Dissatisfied Respondents

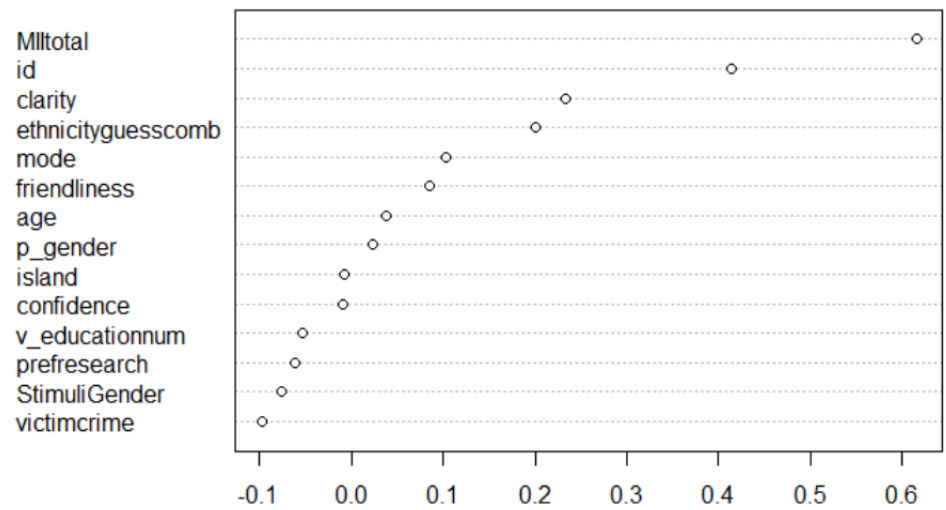
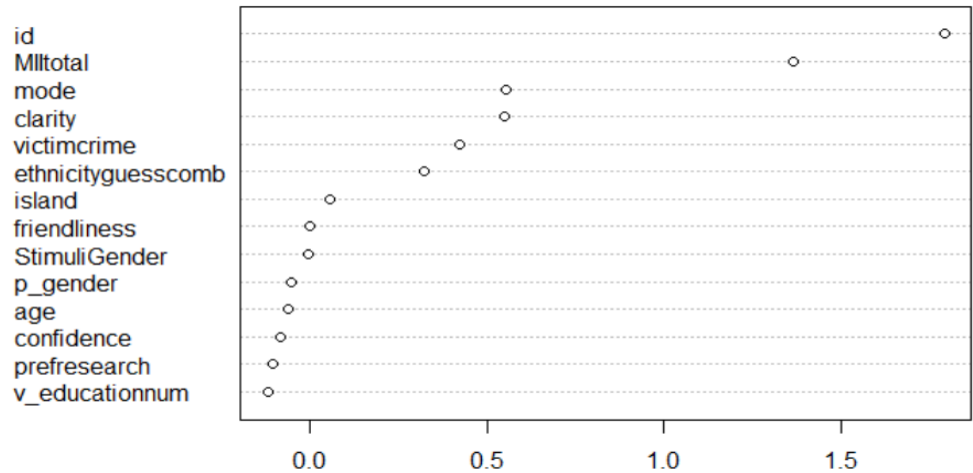


Figure 5.18-3 1.1 Variable Importance plot of Distributional Fairness for Dissatisfied Respondents



5.19 Dissatisfied respondents: Linear regression models

As with the random forest, motive-based trust behaved in much the same way as combined trust and so is not discussed in detail in this section, as with the discrimination PCA component which did not achieve a reliable linear regression model for the overall dataset. The intercept here remains the same as per previous models, except with the addition of the perceived ethnicity reference label being Māori and clarity relates to the lowest score of 0 (in the text condition)

Table 5-9 Linear Regression Models Predicting Attitudes for Respondents Dissatisfied with their Prior Police Contact

	<i>Dependent variable (for dissatisfied respondents):</i>		
	Combined trust	Institutional trust	Distributional fairness
	(1)	(2)	(3)
MII total	-0.446** (0.144)	-0.284*** (0.07)	-0.312** (0.107)
Mode: Text	-8.427*** (2.02)		-0** (0.946)
Island: South	0.801 (1.329)		
Perceived ethnicity: NZE		-1.321 (0.726)	
Perceived ethnicity: Other		-2.621 (0.872)	
Clarity		0.323 (0.151)	
Mode: Text: Island: South	7.241** (2.722)		
Mode: Text: MII total	0.779* (0.298)		
Intercept	22.093*** (1.197)	11.499*** (0.327)	17.985*** (0.937)
Observations	367	367	367
Adjusted R ²	0.26	0.26	0.214
F Statistic	5.76*** (df = 5; 363)	6.9*** (df = 4; 64)	25.888*** (df = 4; 362)

□

The linear models reaffirmed the fact that negative attitude reports from dissatisfied respondents have the greatest effect on overall variation and on the extent to which voice activation is evident. Dissatisfied respondents in the text condition scored approximately 8.5 less points on the combined trust attitude scale than dissatisfied respondents in the audio conditions – this is the equivalent of over 20% of the total available score for combined trust. Yet, of those dissatisfied respondents in the text condition, those who were in the south Island were significantly ($p < 0.01$) estimated to score approximately 7 points more than

those in the North Island who were also within the text condition. A general effect of the dissatisfied respondents in the South Island being estimated to rate 0.8 points less in trust than the North Island was found, but was not significant. Thus the mode of stimuli was a required predictor to establish a location effect. This interaction can be visualised as per the regression plot below (assuming a theoretical intercept with no island):

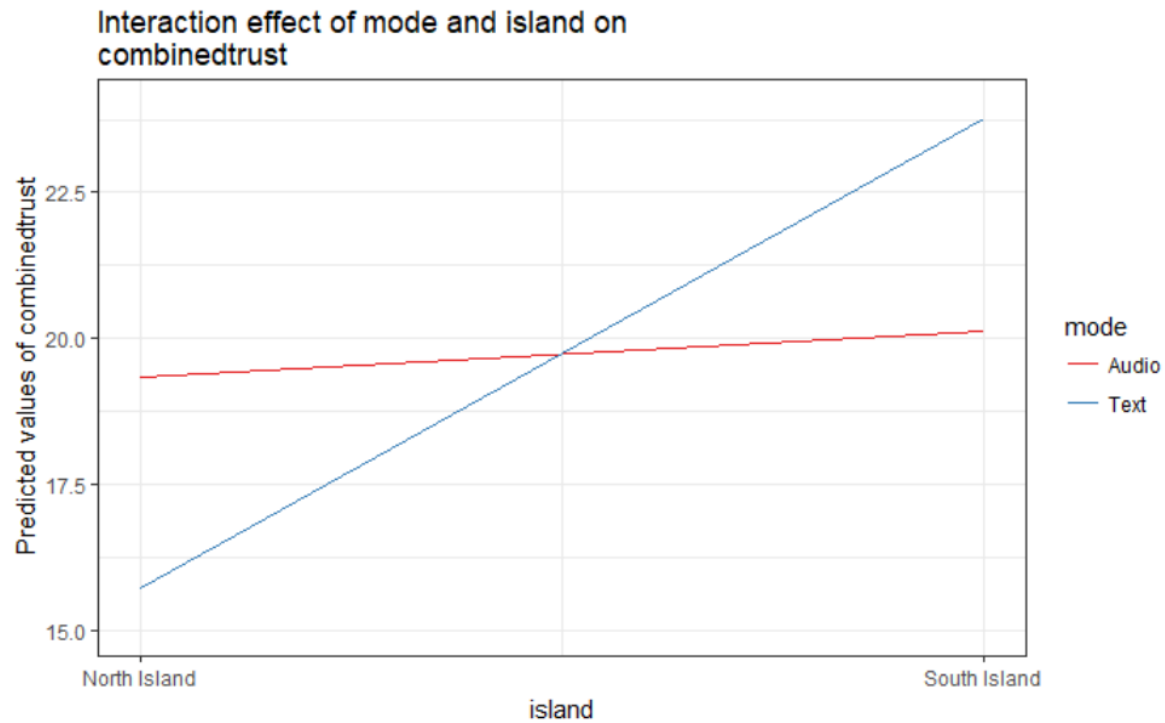
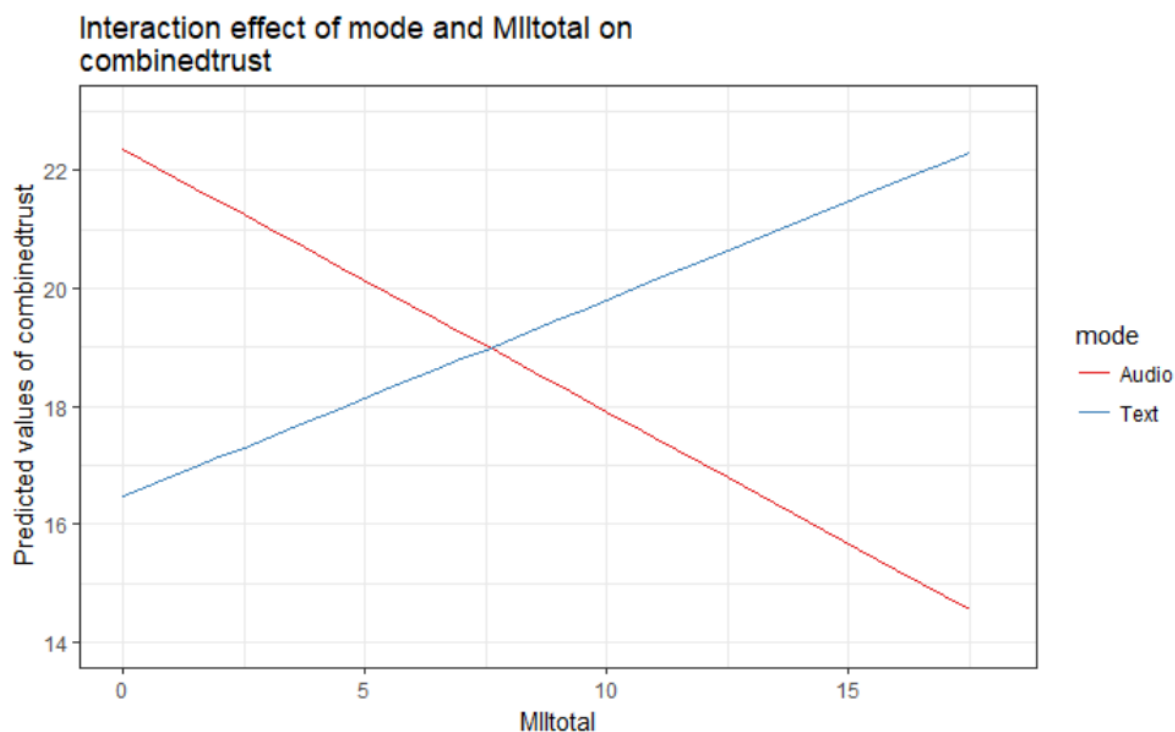


Figure 5.20-1 Linear regression Interaction between Island and Mode of Stimuli in Predicting Trust for Dissatisfied Respondents

Respondents' MII score was also found to be a significant ($p < 0.01$) predictor of dissatisfied respondents' rating of combined trust, with a reduction of approximately half a point on the trust scale estimated to per one point on the MII scale. Yet, this negative effect is only apparent for respondents in the audio condition ($n=43$); there is conversely a significant ($p < 0.05$) interaction effect of respondents in the text condition ($n=26$) where the estimated increase in trust per MII point is approximately half a point. Thus, the implication of this finding is that for those who have had recent negative police contact, the more a person identifies with Māori identity, the less trust in the Police they will report when they are interviewed for their opinion via telephone as opposed to completing online or paper surveys. However, as shall be discussed in more detail in Chapter 6 (Limitations and future research) the likelihood that the interaction between mode and MII total is indeed linear is questionable, given that there were fewer respondents with a high MII total in the text condition than in the audio conditions.

Figure 5.20-2 Linear regression Interaction between MII total and Mode of Stimuli in Predicting Trust for Dissatisfied Respondents



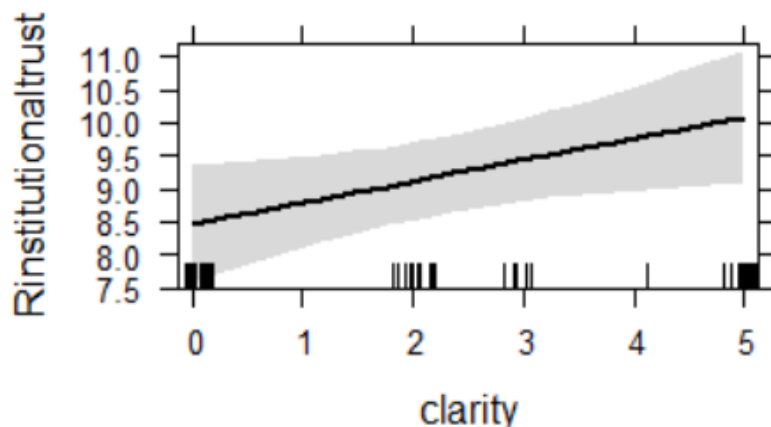
Given that there is a higher proportion of the Māori population in the North Island than the South Island, a three-way interaction arguably may have been expected. However, the interaction effect between Māori ethnicity and mode is perhaps contrasting with the interaction effect between Island and mode, with North Islanders providing a lower trust score in the text condition whereas Māori provide a higher trust score in this text condition.

This discrepancy may be explained by the fact that the levels of trust differing between the islands when considering just the audio condition was insignificant whereas the interaction between the modes of

stimuli and the MII index were significant at both levels. Of course, there are likely to be numerous other predictors that vary across the two Islands, whereby Māori identity may only reflect a small part of the variation (which is highly likely given that this model's adjusted r^2 only explains 26% of variance).

For institutional trust, the independent effect of a respondent's MII score was found to be the most significant ($p < 0.001$). The effect of perceived ethnicity on institutional trust reinforces that which was seen across all participants but in particular for the NZE respondents, when a dissatisfied respondent believes the stimuli represents an ethnicity other than Māori or NZE, they are more likely to reveal lower levels of institutional trust. The estimate of clarity indicates that for each point of clarity (on a scale of 0-5, where 5 is the most clear), the effect on respondents' institutional trust score will increase by 0.32 ($p < 0.5$), as illustrated in the line graph (Figure 5.20-3) below. However, due to the uneven distribution, where most participants in the audio conditions rated at the extreme ends of the scale, as well as the inclusion of text respondents defaulting to a 0 clarity score, it is unclear whether this regression relates to attributes of specific voices or whether it is again reiterating the variation between text and audio conditions as well as the indicating the difference in strength of positive versus negative opinions.

Figure 5.20-3 Linear regression effect of clarity on dissatisfied respondents' level of institutional trust



Dissatisfied respondents in the text condition were also estimated to score 2.5 ($p < 0.5$) points lower for distributional fairness than those in an audio condition, yet this effect was much smaller than was found for the dissatisfied respondents' level of trust. The MII predictor had a slightly larger effect of 0.31 per MII point ($p < 0.01$) than was evident in the model for all respondents.

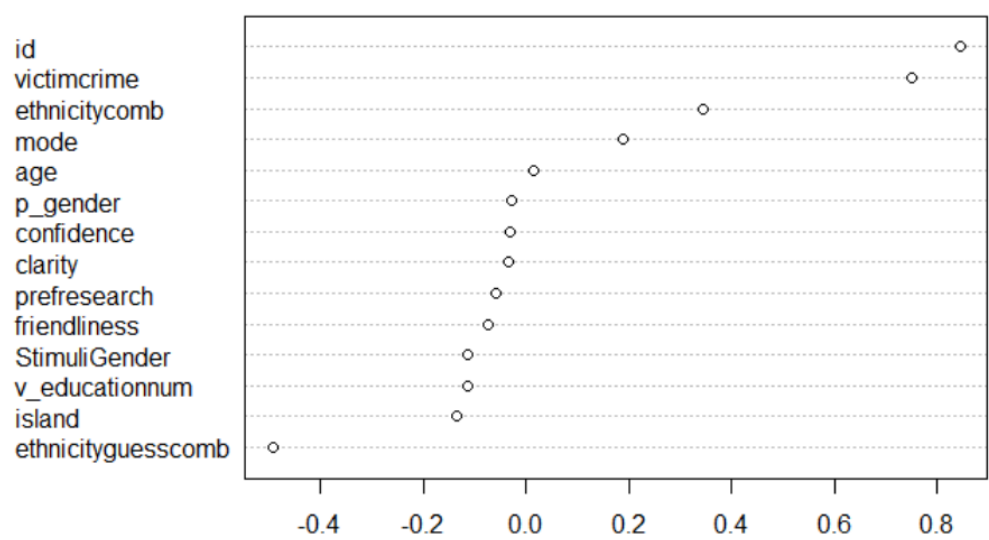
Perceived ethnicity was a significant ($p < 0.01$) predictor in an alternative linear regression model for distributional fairness, where again dissatisfied respondents who perceived the ethnicity to be anything other than Māori or NZE were estimated to provide scores approximately 3.5 points lower in fairness than those who perceived the ethnicity to be Māori. As with the model for institutional trust, the mode of stimuli was not significant either independently or in an interaction with the perceived ethnicity. However, the

linear model with mode as the predictor was chosen as the model of best fit for distributional fairness because it achieved a slightly higher r^2 score and a lower AIC.

5.21 Satisfied respondents and those with no recent police contact

Random forests and associated variable importance plots predicting combined trust were carried out separately for respondents who had satisfactory police contact within the last 12 months, as well as for those who had not had any recent police contact.

Figure 5.21-1 Combined Trust Variable Importance Plot for Satisfied Respondents



Unlike for dissatisfied respondents, a satisfied respondent’s self-reported ethnicity was of more importance than their total MII score in predicting their overall level trust. The second most important variable, almost at the same level as individual variation, was whether or not they had been a victim of crime. The mode of stimuli appeared to have some level of importance in comparison to the rest of the predictors, but the units indicate this was small at 0.2. A linear model did find the two top predictors (excluding individual variation) as significant independently, with those who were victims of crime providing higher scores for trust, as well as respondents of NZE ethnicity providing higher trust scores than respondents of Māori ethnicity, as shown in table 5-10 below. The intercept related to a listener who had not been a victim of crime and was of Māori ethnicity. However, this model for satisfied respondents was clearly more unreliable than the model for dissatisfied respondents, given that it only achieved an adjusted r^2 of 0.0635, with $F(3, 168) = 4.836$. It also had a significantly high AIC value at 1027.67.

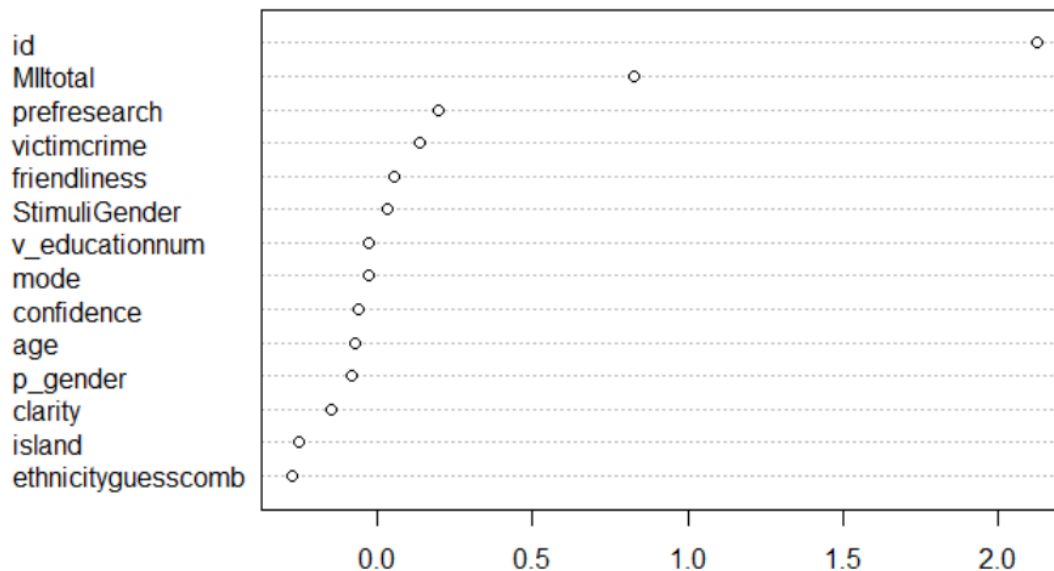
Table 5-10: Linear Regression Coefficients Predicting Combined Trust: Satisfied Respondents

	Combined trust
Intercept	25.779*** (0.876)
Victim of crime: Y	2.507** (0.859)
Respondent ethnicity: NZE	2.557** (0.939)
Respondent ethnicity: Other	1.326 (1.512)
Observations	172
Adjusted R2	0.064
F Statistic	4.836 (df = 3; 362)

Perhaps the most interesting result from this model of combined trust for police research purposes is that those who were satisfied and were a victim of crime were more significantly more likely ($p < 0.01$) to express more trust in the Police than those who were satisfied but were not a victim (thus were potentially offenders or witnesses). Given that being a victim of crime did not appear as an important predictor in the random forest (and thus was not included in the linear regression models) for those respondents who were dissatisfied, this indicates that citizens are generally more satisfied with Police performance in response to them being a victim of crime and thus trust the Police more. However, from the perspective of this thesis in linguistics, neither analyses revealed significant effects of voice priming trust attitudes for satisfied respondents.

The effect of voice was also not found to be important within the random forest, or significant within the linear regression model for predicting levels of trust amongst those respondents who had not had any contact with the Police within the 12 months preceding their participation in the survey. Again, the linear model had a very low adjusted r^2 of 0.03, with $F(1, 124) = 5.317$ ($p < 0.05$) and only significantly predicted a small effect with a reduction of 0.30 points of trust scale per point of MII score ($p < 0.05$). However, the random forest aligned with the linear regression model in predicting the MII score to be the most important predictor after individual variation was taken into account.

Figure 5.22-1 Combined Trust Variable Importance: Respondents with No Recent Police Contact



Similar results were found when predicting both motive-based and institutional based trust for those without recent police contact.

Perhaps surprisingly, respondent ethnicity was not a predictor of distributional fairness for satisfied respondents in the random forest, yet being a victim of crime remained the most important predictor. The voice attribute of friendliness appeared to have some level of variable importance but only the factor of being a victim of crime and the respondent's self-reported ethnicity were significant within the linear models for distributional fairness, to the same extent which was found for the satisfied respondent's level of combined trust. Again, the linear regression model for satisfied respondents also only achieved low fitting statistics (adjusted $r^2=0.071$, 0.085 (on the removal of 2 outliers), $F(3,168)=5.378$, $p < 0.001$). The random forest for predicting levels of distributional fairness for those respondents who had not had any prior contact within the 12 months preceding the survey, appeared to almost replicate that of the findings for trust, with the exception that being a victim of crime was not an important factor in predicting distributional fairness. The prominence of perceived friendliness of stimuli indicates potential for the influence of voice on predicting attitudes; however, the respondents' MII total was again the only significant predictor ($p < 0.5$) in a weak linear model (adjusted $r^2 = 0.033$, $F(1,124)=5.354$, $p < 0.05$).

Figure 5.22-2 Variable Importance Predicting Satisfied Respondents' Levels of Perceived Distributional Fairness

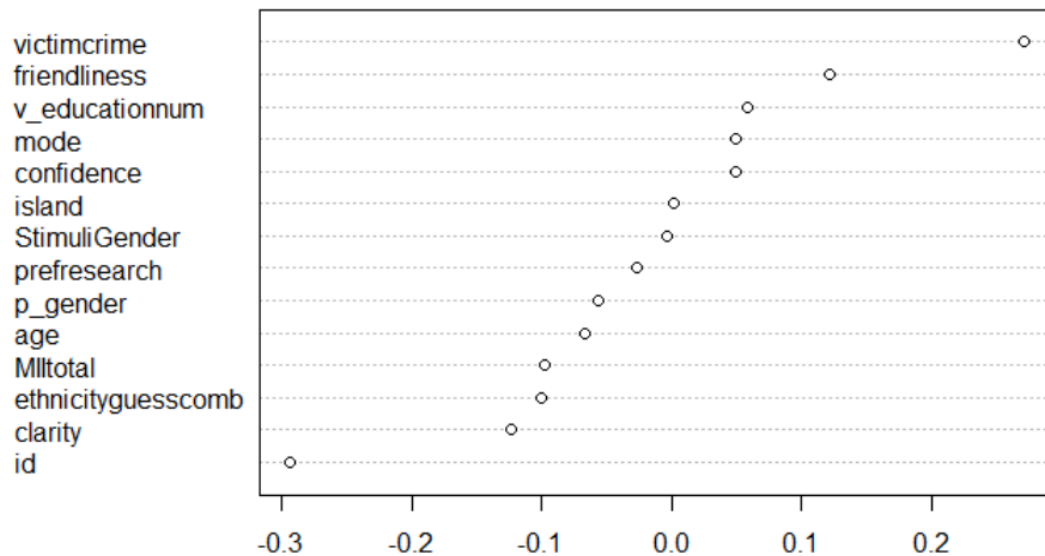
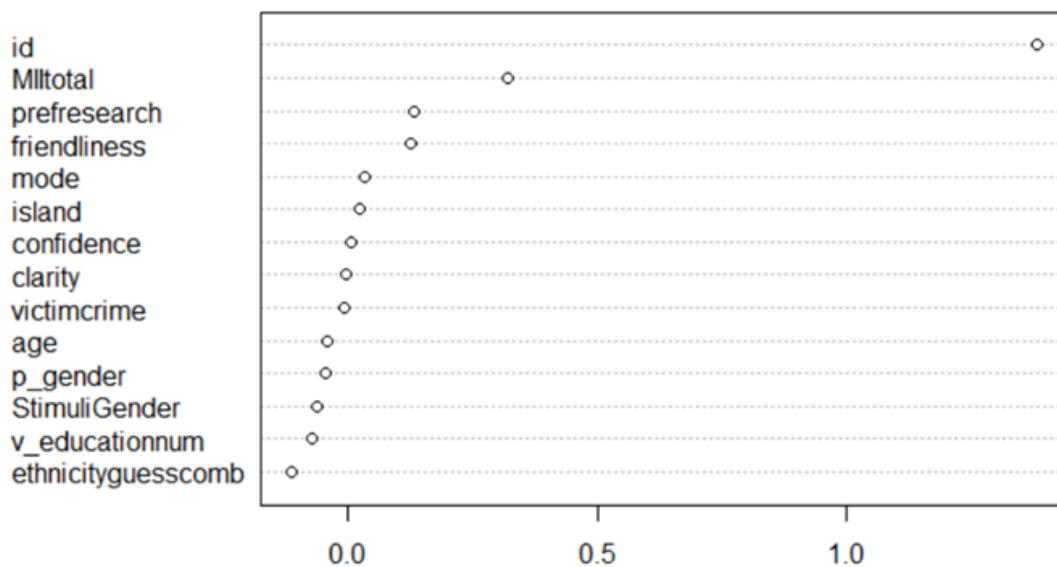


Figure 5.22-3: Variable Importance plot predicting levels of perceived distributional fairness for respondents who had not had recent Police contact



t

In conclusion, this analysis consistently suggests that there was a general effect of Māori providing lower scores of trust towards Police in comparison to respondents of NZE ethnicity, regardless of their prior experience with the Police. However, the hypothesis that voice activation will only be evident for predicting attitudes towards the Police when the respondent has not had any recent Police contact could not be supported from this analysis on the corresponding subsets of respondents. In fact, it appears that the opposite may be the case. This claim can only be supported on one level however, that of those

respondents who were dissatisfied with their prior contact but cannot be confirmed in full due to the weakness of the models for both satisfied respondents and those who have not had recent contact with the Police.

6 Discussion and Implications for Police Research

The most revealing finding to emerge from this exploratory research is that people dissatisfied with their recent Police contact are more likely to be susceptible to the effect of voice on their attitudes towards the Police than those people who were satisfied or who have not had recent contact. The effect of the voice stimuli (or interviewer voice in real-world context) on those who are dissatisfied is complex and dependent upon their individual and social factors but further emphasises the disparity between Police relations with Māori and their relations with the majority New Zealand European population. In terms of relevance to the psychological and linguistic field of voice activation, this work supports MacFarlane's (2014) overall findings that people's attitudes are susceptible to the influence of voice overall but this is not an effect that can uniformly be explained according to social membership categories. These findings will now be discussed in accordance with the research questions and hypotheses which were formed from the existing literature.

6.1 Research Question One: Is a person's level of measurable support towards the Police susceptible to the influence of voice in general?

- H.7. Voice activation in general will occur across all attitude measures, with the text condition being more likely to predict a stereotypical response according to the respondent's ethnic group

The focus of this study was the influence of voice on reported levels of trust in the Police and citizens' assessment on the level of fairness shown by the Police. The fact that MacFarlane (2014) did not find a significant difference between his control text condition and female voices, whilst he did for the male voices, suggested that voice would not have an overall effect on the likelihood of a respondent to agree with a statement. However, as detailed in Section 4.1 of the literature review, the research on familiarity and behavioural priming led to the formation of Hypothesis 4.1. The text condition was deemed to be the most unfamiliar stimuli for the respondent and thus without having linguistic cues in voice to generate a frame of reference, it was expected that results for respondents in this group would differ significantly from the audio conditions combined, by indicating attitudes in accordance with the stereotypical response of their ethnic group. In other words, the expectation was that within the text condition Māori would report less trust in the Police than New Zealand European respondents.

Two statements were selected from the Citizen Satisfaction Survey (CSS) (Gravitas, 2017) for the purpose of serving as the baseline measures of trust and fairness for a comparison with the CSS findings, as well as a comparison to attitudes in line with the procedural justice framework (Tyler, 2001, 2005). The results for these baseline measures revealed a significant effect of mode of stimuli, resulting in lower levels of trust in, and perceived fairness of the Police for those respondents in the text condition in comparison to those in an audio condition. There was no significant effect between the mode of stimuli and perceived ethnicity for these baseline variables, although Boxplot 5.7 1 suggested that Māori were more likely to have less trust in the Police if they were in the text condition. This negative effect of the text

mode held for Tyler's (2005) concept of Institutional trust but not for motive-based trust. This disparity suggests that the effect of audio priming only holds for certain aspects of the latent attitude variable of trust but this question remains open for further research as a topic in its own right, given that only a handful of statements reliably constituted the two separate measures of trust using Cronbach's alpha. Nevertheless, when the factors of institutional and motive-based trust were merged into an overall, the negative effect of the text mode was once again significant. The analysis on the abstraction of fairness was broadened from the participant's perception of fairness in regards to their own treatment by the Police (as measured in the baseline fairness construct) to the extent in which Police are perceived to be fair across communities. The text stimuli was again found to predict more negative levels of perceived fairness overall, but not on the attitude relating to discrimination from the Police, an abstract construct created using Principle Component Analysis.

The only interaction between mode of stimuli and respondent ethnicity was found in predicting dissatisfied respondents' overall level of trust. In this group the mode of stimuli also interacted with the respondent's island of residence (as will be discussed in the answer to Research Question 2). The fact that interactions were not found between mode of stimuli and perceived ethnicity (or any other demographic factors) across the population sample however, reinforces MacFarlane's findings that voice activation is contextually dependent rather than a necessarily automatic cognitive process at a more global level (2014, p. 157). Yet, it also supports the findings on the significance of stimuli familiarity (Huang et al., 2011; Song & Schwarz, 2008), by suggesting that responding to text is a more cognitively demanding task than responding to a voice, which is a composite of linguistic resources which are available to aid one's opinion formation. Thus respondents are more likely to deliberate a more negative response within the text condition.

As such, this study has revealed substantial evidence suggesting that overall respondents are likely to report lower levels of trust in the Police in a text-based survey than in a voice based survey. However, these results should only be interpreted as a pilot study with significant limitations, which will be discussed in Chapter 7.

6.2 Research Question Two: Does the perceived ethnicity of voice prime attitudes towards the Police and, if so, does this suggest a semantic association between Māori and the Police?

- H.8. There will be an interaction between perceived ethnicity and respondent ethnicity (either through MII score or ethnicity);
- H.9. When Māori ethnicity is less personally relevant to the listener, the dependency on the voice to shape their opinion will increase with a Māori voice condition prompting less trust in the Police. The directional effect for NZE respondents will differ for distributional fairness, where they will either report higher scores in a Māori condition due to a

preference for a national identity, or conversely they will provide lower scores in this condition due the perceived injustice towards Māori.

H.10. When Māori ethnicity is more relevant to the listener, there are two potential directions:

- a. Indifference to voice/ negativity bias towards topic: respondents will report less trust in the Police in which condition
- b. Negativity bias towards voice: respondent will report more trust in the Police in a Māori condition than a NZE condition

It was hypothesised that if ethnicity based priming was found in the attitude of distributional fairness and not in the more generic Police trust this would have suggested that the semantic frames of the Police are too far removed from the frame of ethnicity and Māori in particular to affect priming. However, as discussed, the effect of perceived ethnicity through voice or perceived ethnicity of the witness in the text condition, was not overly significant as a priming device) in predicting levels of trust towards, or perceived fairness of the Police, between the Māori and NZE ethnic groups.

This hypothesis can be fully rejected in that no attitudes could be predicted by an interaction between perceived ethnicity and mode of stimuli, let alone an interaction with respondent ethnicity (in either binary form or MII score). In particular, perceived ethnicity was not found to be significant between Māori and NZE respondents across any attitudes, including those that were most predicted to have an effect due to semantic association, motive-based trust and distributional fairness. Therefore, it cannot be argued that respondents demonstrated any strength of association between Māori and attitudes towards the Police. This is a rather unexpected finding given that four statements explicitly referred to Māori relations with the Police and, even though they did not correlate enough to be included within any of the attitude variables, it would be expected that the mention of the word in the overall task would be enough to prime an association in the statements which did not explicitly mention Māori (Bargh, et al., 1992). The Māori Integration Index provided an indication of the respondent's level of exposure to Māori culture, through social networks as well as individual participation in Māori related activities. The fact that the MII did not interact with perceived ethnicity of voice suggests that the level of familiarity with the social membership category in the prime is not a direct predictor of attitudes towards the Police in this NZ based pilot data set.

Perceived ethnicity was found to be independently significant ($p < 0.01$), however, only for predicting dissatisfied respondents' level of institutional trust. In this model, the respondent was estimated to give lower trust scores if they perceived the stimuli to be of an ethnicity other than Māori or NZE (22% of all respondents). Respondents were estimated to score lower if they perceived the ethnicity to be NZE rather than Māori but this was not quite significant enough ($p = 0.07$). To reiterate however, there is no evidence to suggest that the effect of perceived ethnicity was solely a function of voice, given that 36 respondents in the text condition perceived the text to represent another ethnicity compared to 45 participants across

the audio conditions. In order to be auditorily primed by ethnicity, a listener must be able to categorise the voice according to an ethnicity; it may be significant therefore that 18% of respondents in the voice conditions either could not guess the ethnicity of the speaker, or they perceived them to be of ethnicities other than NZE or Māori. Only 33% of speakers in the audio conditions perceived themselves to be in a Māori condition (and 21% of those guessed incorrectly), whilst 49% of the audio respondents perceived themselves to be in a NZE condition (and 26% of those also guessed incorrectly).

Nonetheless, despite there being no significant interaction with voice, the effect of perceived ethnicity is an interesting finding in comparison to the findings in Sibley & Liu (2007), where those of NZE ethnicity endorsed a bicultural New Zealand identity whilst those of both NZE and Māori ethnicity did not perceive those of Asian descent as New Zealanders (Sibley & Liu, 2007). Thus, again in line with the literature on familiarity, if the stimuli in the current study was not perceived as representative of either of the bicultural identities, it was less familiar to the respondents and as such required more cognitive processing. This additional processing therefore may have activated a negativity bias from the dissatisfied respondents towards the topic of the Police, rather than the voice itself, as suggested by the fact that there was no interaction between perceived ethnicity, mode of stimuli or the individual voice attributes such as friendliness or perceived level of education.

6.3 Research Question Three: How important is voice as a predictor in relation to other predictors known to influence attitudes towards the Police, namely their prior experience with the Police and ethnic identity?

- H.14. Voice activation will only be evident (shown by the overall mode of stimuli independently or interacting with perceived ethnicity) for predicting attitudes towards the Police when the respondent has not had any recent Police contact

There was unanimous agreement between both statistical approaches of the random forest and Linear Regression models in that a person's previous contact with the Police was found to be the primary predictor for both reported and trust and perceived fairness. In terms of the relative importance of mode of stimuli across the whole dataset, mode was always the least significant variable at the level of $p < 0.05$, whereas Police contact was always significant at the highest level of $p < 0.001$.

The hypothesis suggested that voice activation was more likely to occur when the respondent had not had any Police contact because they would be more reliant upon linguistic cues in the voice to form their opinion at that given point in time, whereas individual experience would be more relevant than the voice for those who have had contact. Conversely, it was only when a respondent had had either positive or negative contact with the Police that the mode of stimuli was found to be important, in both the random forests and linear regression models. It could be argued therefore that voice priming acts as a neutraliser for negative attitudes towards the Police because when respondents who have not had any recent police contact were analysed, the mode of stimuli was not found important by the random forest for trust, and was only of minimal importance for distributional fairness. From a theoretical perspective, this also

suggests that rather than the voice being a pool of resources to aid in the formation of an attitude, the importance of voice is as a tool in which respondent can frame their own independent experiences against.

It was for those respondents who were dissatisfied with their prior Police contact where the mode of stimuli became most important variable in the random forest and significantly interacted in the linear regression model for trust in the Police. Those in the text condition were estimated to give scores of approximately 8.5 points less (out of 40) in overall trust towards the Police than dissatisfied respondents in the audio conditions. Furthermore, for dissatisfied respondents, their island of residence interacted with their affiliation with Māori ethnicity (through the use of the MII score). Dissatisfied respondents in the South Island were significantly ($p < 0.01$) more likely to give higher score levels (7 points more) of trust in the text condition than dissatisfied respondents in the North Island in the same condition. The interaction discovered between mode and MII revealed that those with different MII scores behaved differently in terms of predicting trust depending upon whether they were in a text or audio condition. For those in the text condition, a higher MII score predicted higher trust scores ($p < 0.05$). Yet, the MII score was a predictor of trust independently from the mode of stimuli, whereby a higher MII score conversely indicated a lower level of trust overall. Thus, it appears Māori dissatisfaction with the Police was heightened in the voice condition and may allude to the findings by Williams et al., (2008) on racial self-presentation, given that less trust in the Police would be the stereotypical response by Māori. However, given that perception of ethnicity was not significant, it cannot be claimed that this was an effect of conforming to in-group norms in relation to both an intra and inter-group interactional context, in accordance with frameworks such as Communication Accommodation Theory (Giles & Gasiorek, 2013).

Although it was not significant, there does appear to be an interaction between the MII score and the island of residence. There is an indication that those of a Māori identity in the South Island would provide higher ratings of trust towards the Police in a text condition than in an audio condition. Although these two variables do not significantly interact together with the mode of stimuli however, a loess smoother plot, Figure 6.3-2, reveals a relationship between the three predictors of trust in the Police (refer to Chapter 7, Limitations, for further discussion on potential polynomial regression findings). Given that the survey sample lacked respondents with a high MII score, it appears that the lower scores from NZE respondents in the North Island are responsible for this interaction, as evident in Figure 6.3-1, the boxplot according to self-reported ethnicities. In fact, there was a smaller than optimal sample of Māori (or higher scoring MII respondents) in the text condition who resided in the South Island (a non-surprising finding, given that it is in the northern half of the North Island where the proportion of Māori population is at its highest, Statistics New Zealand (2013)). The difference between the Islands is smaller across the audio conditions, yet there is a large dip in the level of trust for those respondents who scored between 5 and 15 points in the MII score in the North Island, compared with those who scored around 10 and revealed the least trust in the Police. The mean MII score for dissatisfied participants was 6 points out of a possible 21 points. As

the matrix in appendix 10.3.10 shows, this score could have been achieved by a respondent who does not index any Māori ethnicity but sometimes watches Māori television, listens to Māori radio and who may interact with Māori in their extended social circles. Given that these respondents have reported an unsatisfactory experience with the Police, their levels of trust are still low but equate to about 25% of the highest score, across the entire sample of 39 points. To gain a score of 10 on the MII measure, the non-Māori respondent would have to engage with Māori media more often, or the respondent could claim some Māori ethnicity, with a lower cultural engagement. This is the population demographic who have strongly negative views towards the Police which appear the same regardless of mode of stimuli.

Figure 6.3-2 A Loess Smoother Plot on a Potential Interaction between Mode, Island and MII total for Dissatisfied Respondents

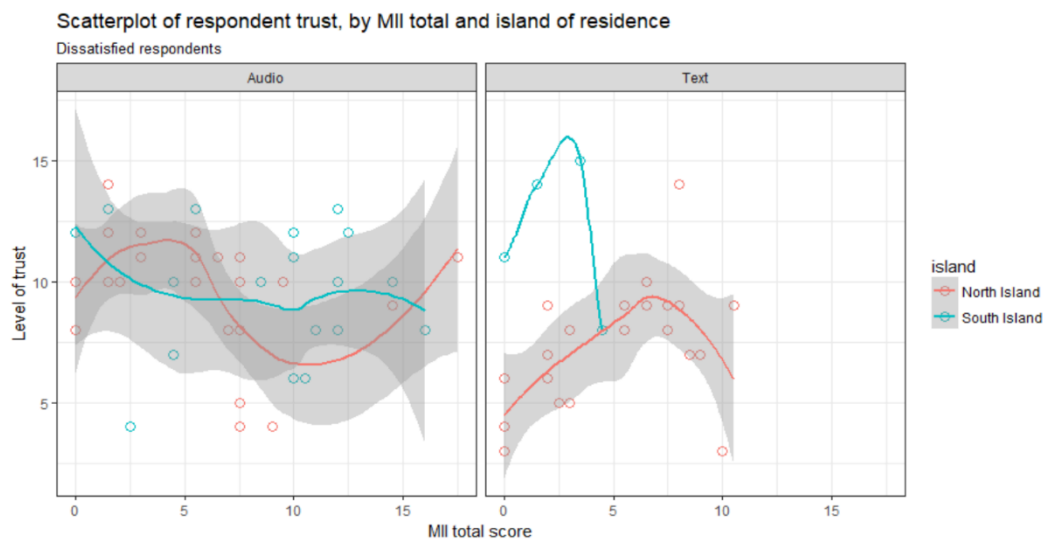
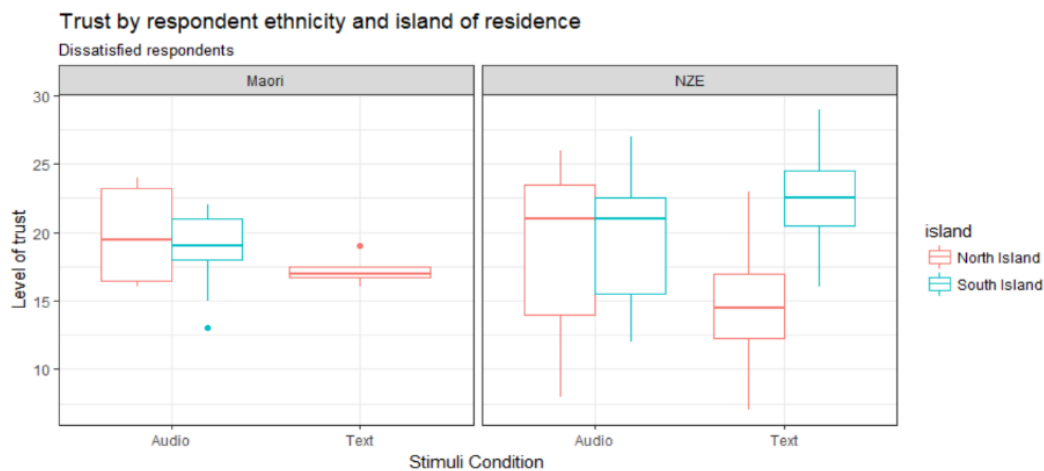


Figure 6.3-3 Boxplot of Trust by Self Reported Ethnicity and Island of Residence across Mode of Stimuli



In general, the distribution pattern of trust and fairness, as indicated by the baseline statements, follow that of the CSS – however, the comparison with percentages show that a higher proportion of respondents in the present study rated the Police more negatively for both measures.

The strong independent effect of ethnicity on attitudes towards the Police was predicted in line with the findings of the Citizen Satisfaction Survey (CSS) (Gravitas, 2017) and the focus groups conducted in the late 1990s (Maxwell & Smith, 1998; Te Whaiti & Roguski, 1998). The visualization of data appeared to support the CSS finding that Māori gave lower scores for both levels of trust and perceptions of fairness in the Police. It was only in the subset of dissatisfied respondents where those of NZE ethnicity provided lower scores for the scores than Māori respondents if they were in the text condition or if they were in an audio condition and perceived the ethnicity of the speaker to be anything other than Māori or NZE. On the other hand, Māori respondents tended to provided higher scores of trust and perceived fairness (including higher scores in the discriminatory PCA component, which conversely meant they viewed the Police as less discriminatory) when they perceived the ethnicity of the speaker to be NZE, regardless of the stimuli condition.

However, neither self-reported ethnicity nor the Māori Integration Index were significant predictors in the linear regression model across the whole dataset for the baseline trust and fairness measures that were derived from the CSS itself. Yet, MII was significant across the dataset for measures of institutional trust and distributional fairness, which were the measures concerned with Police interactions within the community as a whole, with attitude ratings decreasing as MII score increases (albeit to a small effect. Furthermore, it was only when analysing respondent groups by police contact levels that the effect of respondent self-reported ethnicity was significant, supporting the premise that ethnicity is a fluid and complex construct.

It is also of interest that the effect of voice was evident for motive-based trust but not for institutional trust regardless of the respondent's experience with the Police. For institutional trust, a respondent's MII score and perceived ethnicity of the speaker (but only when the respondent was dissatisfied, as addressed in research question two) were the most important factors in the random forest and linear regression model. The mode of stimuli was also not an important variable for the discrimination-related attitude component arrived at by the Principle Component Analysis. Thus, whilst the mode of stimuli was a somewhat important factor overall on the global measure of trust in the Police, its effect is most evident on encounter-specific attitude measures. This, therefore, supports the research by Maguire et al., (2017) who found that the outcomes were more susceptible to the effects of procedurally just treatment than the outcome measures relating to the Police institution overall (2017, p. 385).

These results suggests that the dominance of Police contact over race as a predictor of attitudes towards the Police found in Canada and the USA (Alberton & Gorey, 2018) holds true in the New Zealand context as well. Evidence has been in line with Alberton & Gorey's call for research understanding how specific the attitudes of specific ethnic groups towards the Police vary depending upon their prior Police contact

(2018, pp. 9-10). It goes beyond this, however, by revealing an interaction between mode of survey and ethnicity that is apparent for those with negative prior experience, showing that the medium of the survey may produce quite different responses for a respondent according to their ethnic group. The mode of stimuli was also significant for those who reported satisfied prior contact but not to the same extent and the mode of stimuli did not interact with ethnicity for these respondents (although ethnicity was significant independently).

6.4 Research Question Four: Are there any (further) identifiable aspects of voice that predict opinions towards the Police?

- H.16. Respondents are more likely to agree with the statements, regardless of the content, if the stimuli is – or is perceived to be - female as opposed to male

The only additional hypothesis that could be made in regards to voice activation being predicted by social meaning was that the gender of stimuli effect overall agreement to the statements, as found by MacFarlane (2014). Other additional aspects of voice were controlled for in relation to speech perception research: friendliness, confidence, perceived level of education and clarity of voice. However, the hypotheses in this regard was that they would not have an effect due to the prediction of perceived ethnicity being the predictor of voice activation.

The perceived gender of the stimuli was significantly ($p < 0.05$) found to interact with the respondents' status as a victim of crime on overall agreement across the survey (for both positively and negatively framed statements), with victims being less likely to agree if they perceive the stimuli gender as male compared to female. This follows MacFarlane (2014, p. 74) who also found respondents disagreed more in the male condition rather than the text condition. However, overall agreement was not found to be a reliable response variable and the gender of the stimuli was not found to be significant in any of the linear regression models for Police supportiveness, as indeed it was not for MacFarlane's models of supportiveness. Stimuli gender was also non-important with all other random forests. Unlike MacFarlane's study, however, respondent gender was not significant within any of the models or important within any of the forests, for this study.

As per the baseline measures adapted from the CSS, the voice perception control predictors were of little importance or significance in predicting wider trust and fairness attitudes. . The random forest for distributional fairness, for the subset of satisfied respondents, ranked friendliness as the second most important factor but it did not have a significant effect in the linear regression model. The same pattern held for voice clarity as a predictor of motive-based trust. Voice clarity was significant ($p < 0.05$) in predicting institutional trust for dissatisfied respondents, but the effect was small; 0.32 trust increase per point of clarity. Due to the scaling of the variable, however, this is potentially replicating the effect of text/audio mode of stimuli. Thus, whilst limited attributions of social meaning were found as a potential

explanation for the voice activation effect, it can be sufficiently concluded that the effect was not as a result of these individual voice predictors.

6.5 Recommendations

The main recommendation from this thesis is that citizen satisfaction data should be assessed with the method of collection in mind (and preferably treated as a predictor in regression models, should these be performed for studies in the near future). This is a particularly timely finding given that the CSS has only recently introduced both online and paper-based methods. The present research suggests that it is the impact of voice that is influencing the respondents' opinions rather than their preferred method of participation in citizen satisfaction research, given that the latter was not found to be significant. Although the effect of voice was found on the global measure of trust, it appears that encounter-specific attitudes are more susceptible to voice activation rather than those that evaluate the Police as an institution and thus the results should be a particular consideration for service evaluation surveys.

The fact that the extent to which the respondent was integrated into Māori culture was a predictor of attitudes of trust towards, and perceived fairness of, the Police suggests that the highly publicised efforts of the Turning of the Tide campaign (New Zealand Police, 2012) may not yet have fully achieved the goal of increased trust in the Police by Māori. On the one hand, ethnicity was not a predictor of motive-based trust which implies efforts to be both more culturally appropriate and informative in engagements on the ground between the Police and the public have been successful. However, the fact that level of Māori integration was a predictor for the respondents' level of institutional trust in, and perceived distributional fairness of, the Police suggests that the more integrated one is in Māori culture, the more likely they are to have a viewpoint that the Police as an institution are not committed to working alongside Māori to serve their community. Yet, levels of trust for dissatisfied respondents indicated the lowest levels of trust were found in respondents who were linked to Māori ethnicity to some extent but were not fully immersed in the culture. Thus this suggests that Māori attitudes towards Police are connected with Māori level of self-esteem that in itself relies upon connection with their intra-group (c.f. Houkamau & Sibley, 2010). By extension of the fact that offenders are the most likely to be dissatisfied with the Police-initiated contact, this current research may refute the claims by Marie (2010) that lack of Māori cultural identity is a factor of Māori overrepresentation in the justice system.

Therefore, future research into Māori attitudes towards the Police should pay particular attention to the attitudes of Māori with weak ties to their community. However, it is acknowledged these can only be considered as tentative claims from pilot research, given that the weighting of respondents with the highest level of Māori integration was low.

Along with confirming some effect of respondent ethnicity, this research reaffirms the importance of prior contact on citizens' trust and confidence in the New Zealand Police, in accordance with Alberton & Gorey, (2018). As with Skogan (2006), there is an asymmetrical effect between positive and negative police

contact; whilst when compared to those who had no contact the coefficient for satisfied respondents is above zero and is highly significant ($p < 0.001$) for trust (unlike Skogan, 2006, p.111), the negative effect of dissatisfied police contact on trust was over three times greater. The same ratio followed for the satisfied/dissatisfied respondents when the predicted response variable was perceived distributional fairness by the Police, although the coefficients were smaller than with trust. Thus, despite New Zealand's unique placement as a bicultural post-colonial country, Police researchers would do well to consider trust and confidence studies that have come from other jurisdictions across the world.

The findings have also alluded to the fact that New Zealanders, of European descent in particular, may be embracing the official bi-cultural identity to such an extent that when hearing either a Māori or a NZE voice, there is a larger intra-group effect of being a "New Zealander". Therefore, they may be more susceptible to attitude priming when the voice is perceived to be of an ethnicity other than NZE or Māori. Although further research specifically looking at priming by voices of other minorities (Pasifika, New Zealand Chinese, etc.) is required before reaching any firm conclusions, these findings may suggest that the New Zealand public perceive the Police, as an institution, has potentially neglected the needs of minorities smaller than the Māori population.

7 Limitations

As exploratory research, this thesis has considered two regression approaches, traditional linear regression and variable importance from random forest, in order to investigate the effect of voice activation upon the level of trust a person holds towards the Police and the extent to which they perceive the Police as being fair across communities. Whilst there is evidence of overall voice priming on attitudinal behaviour, the analysis has shown that neither of these approaches can account for the full scope of the variation within the data. This section will therefore consider potential reasons for this and then propose suggestions for further research.

7.1 Survey methodology

MacFarlane (2014) cautioned that the only findings he found with regards to ethnicity priming behaviour (participants were more likely to guess the origins of music as Asian when they heard an Asian voice) could be due to respondents becoming consciously aware of the voice stimuli given the unusual nature of the task in comparison to everyday activities (2014:111). In the present study, potential participants were told that the survey aimed to establish whether the polls (i.e. the Citizen Satisfaction Survey) were “asking the right questions, to the right people.” Whilst the relationship between an interviewer’s voice and respondents’ attitudes towards the Police is not necessarily an obvious one, respondents may have paid more attention to the voice stimuli, given that the nature of the task involved voice recordings rather than a solely text-based survey, which may have been more expected in the context of the aim stated to the participants. Furthermore, the task involved rating agreement to both objective CSS statements and emotively-charged statements from the focus groups (Maxwell & Smith, 1998; Te Whaiti & Roguski, 1998). Therefore, the research cannot confirm whether the voice activation effect would be replicated in the context of the CSS findings. However, given that the mode of stimuli was significant for both measures of baseline trust and fairness taken directly from the CSS, this may indeed be the case.

7.2 Measurement of latent variables: trust and fairness

This exploratory research has inevitably taken a somewhat subjective approach to applying the initial selection of statements to the latent measures of trust and fairness and even by using Cronbach’s alpha and Principle Component Analysis as validation tools, various decisions were required that were reliant upon individual interpretation (Field et al., 2012:807). As such, this pilot research cannot claim a definitive analysis on the measures of trust towards, and perceived fairness of, the Police. The measure that was defined as “combined trust” revealed results aligning with the wealth of criminology literature by indicating the overwhelming effect that negative police contact has on one’s level of trust, with low standard errors against this coefficient in particular. However, the linear regression models for predicting distributional fairness were not as strong (in that they achieved lower fitting r^2 and F distribution-statistics and standard errors were larger against the dissatisfaction coefficient) as the combined trust measurement. The distributional fairness attitude was insufficient enough to provide evidence that the strength of association between topic and stimuli (perceived ethnicity) was important, instead revealing the importance of the

respondents' ethnicity, which was not so evident at the macro level of the generic trust measure. Yet, the Principle Component Analysis revealed a group of statements that displayed a significant discrimination component within the survey. It was here that the association between topic and stimuli had an effect, with the voice or the text being perceived as someone other than a person of Māori or NZE ethnicity resulted in a lower perception of fairness shown by the Police. Given that the distributional fairness measure was based upon the existing research, this finding suggests that much more work on inter-ethnic perceptions is required within the context of the fairness component in the procedural justice framework.

7.3 Assumptions of non-collinearity

By constructing response variables using Cronbach's alpha as a validation tool, the statement groupings were deemed to be sufficiently reliable measures of attitudes towards the Police. However, the consequent assumption was that the statements themselves would not have influenced the participants' total score in the aggregate response variables. Consequently, the effect of the statements was not included as a random effect within a linear mixed effects regression model. Indeed, when attempting to do so with a factor accounting for the statement ID, the models failed to converge with an overly high eigenvalue; again, most probably due to the limited amount of data that was collected within the constraints of this thesis. However, it must be conceded that there was an unavoidable amount of collinearity between the statements. This was evident when statements which did not constitute the response variable were added as predictors in their own right to the linear models and they accounted for more significance than the demographic and conditional factors, including Police contact. Once more, this indicates that results from the Random Forests may in fact provide more reliable explanations for the data variance, given that they do not assume non-collinearity (Tagliamonte & Baayen, 2012:161).

Additionally, it is possible that the attitude response variable of trust may have correlated with the respondent's perception of distributional fairness and, therefore, this could have skewed the null result of ethnicity voice priming. For example, if respondents perceived the speaker to be Māori and were initially presented with statements that constituted perceived distributional fairness, this may have affected their responses to any of the following statements that constituted the measure of trust, differently than if they perceived the speaker to be of NZE ethnicity. Although the randomisation of statement ordering – whereby each respondent would have been presented with a unique order of statements – could have mitigated this risk; in hindsight, it would have been ideal to identify which attitude measure (i.e. trust or fairness) the participants were first exposed to. Furthermore, respondents' level of trust in the Police could conceivably have been primed from the prior scenario if statements that constituted this attitude directly followed. Therefore, if this study was replicated with a sample size significantly larger than the number of predictor levels, it may be appropriate to construct a MANOVA model; comprising of trust, perceived distributional fairness and willingness to cooperate with the Police (to be established from the scenario test) as dependent variables. This could also include a predictor coding the order in which they

were exposed to attitude measures (i.e. whether they were first presented with a trust or fairness statement).

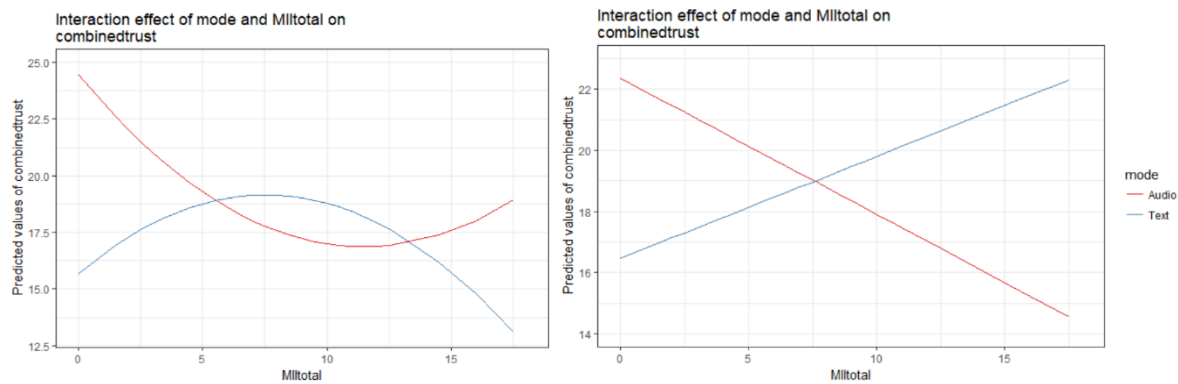
7.4 Statement framing and respondent's strength of opinion

The initial intention of this thesis was to also analyse the contextual effects of the source of the statement (whether they were adapted from the CSS or focus group) and the linguistic framing of the statement; in particular, its negative/positive polarity. The distribution of data across each statement indicated that the stronger opinions did not arise according to the polarity, given that both types received positive and negative strong responses. It was attempted to capture this personality characteristic robustly with an 'opinion' predictor. Respondents gained two points for every statement in which a strongly agree/disagree answer or "I find this statement offensive" was selected, one point if they agreed or disagreed and zero points if they neither agreed nor disagreed with the statement. This predictor, alongside the other statement effects, was included in random forests for each of the response variables. In all of these forests, the statement variables were the least important predictors and thus, the decision was made to revert back to the participant- only data and disregard the statement effects. In larger data frames, it might be possible to evaluate the interaction between framing and opinion strength

7.5 Available data sample and possible polynomial regression across the Māori Integration Index

The data that was obtained within the scope of this thesis was proportionally small to the number of predictors. In particular, the survey did not receive the desired weighting of Māori respondents which may have impacted on the reliability of a comparison between ethnicities. The Māori Integration Index (Szakay, 2007) mitigated this to an extent, by refocusing on the degree to which people interact with Māori culture. However, the distribution of participants was still positively skewed to those having a lower rather than higher MII score. Figure 6.3 2 revealed a potential polynomial relationship between one's MII score and level of trust, if the participant was in an audio condition. Thus, this interaction presented a different picture to the linear relationship model, whereby instead of trust continuing to increase at the upper level of the MII in the text condition, it rapidly fell. Similarly, trust began to increase again for higher scoring respondents in the audio condition, having fallen to the lowest of approximately 16 points for those scoring around 10 on the MII. Figure 7.5-1 below presents the polynomial interaction between mode and MII total (on the left) in comparison to the linear interaction presented in section 5.19 of the results, on the right.

Figure 7.5-1 Comparison between a polynomial and a linear regression on the interaction effect of mode and MII total, in predicting trust for dissatisfied respondents



When this polynomial regression was formally tested, only one degree out of the two remained significant which confirmed that the variation at the higher end of the MII was due to noise and having too few participants. The adjusted r^2 for the new polynomial regression model marginally increased to explaining 29% of the variance (.04 more than the linear regression) whilst the Akaike information criterion (AIC) remained approximately the same. As such, the linear model was kept as final for the purposes of this thesis, but the potential for the relationship between respondents' MII score and the mode of stimuli to be polynomial should be kept in mind for future research with a larger Māori population sample. The reoccurrence of the MII total alongside the mode of stimuli in the Random Forest does, however, substantiate the claim that there is a complex relationship between a person's affiliation with Māori culture and the medium in which they are asked to report their level of trust towards the Police.

8 Potential directions for future research

8.1 Additional attitude behaviours

As was discussed in the methodology, the Principle Component Analysis revealed that general satisfaction with Police service could be a reliable attitudinal measure for priming analysis. This is an avenue for further research which may be better served with a dataset capturing more information on the respondents' interaction with the Police, such point of contact and type of crime. Given that 7 out of the 10 statements which weighted onto this component were from the Citizen Satisfaction Survey and the two statements regarding respondent safety highly correlated into their own measure, it would be particularly ideal to conduct similar analysis on the recent (2016-2017) CSS data, which itself is now multi-modal.

8.2 Priming cooperative behaviour and respondent judgments of others

Although it has been found that a person's explicit attitudinal behaviour is limited to the extent in which it can be susceptible towards voice activation according to their perception of the speaker's ethnicity, this thesis has not investigated whether this perceived ethnicity could influence the listener's judgement of the speaker's actions. As discussed, the scenario test was included for purposes of future research in this

direction. In that task, respondents were explicitly required to judge a voice (or narrator if in the text condition) by providing a free-text response as to whether the witness was correct in their actions (or lack of) and the rationale for this judgement. The qualitative analysis necessary for this part of the survey was out of scope for the thesis but has potential in future research where, in line with (Johnson et al., 2017) it is hypothesised that the perceived ethnicity of the speaker will be an important predictor in respondents' outcome judgments. Metadata was also captured for the scenario test, recording the time of the first click when they started on that page, as well as the last click and overall response time. Thus, future analysis could reveal whether response times could be a predictor for the willingness to cooperate dependent variable, since if there was an interaction with ethnicity priming here, sympathetic to the witness, it may be the case that those participants were also primed for a lower distributional fairness response when perceiving the witness as an ethnicity other than Māori or NZE.

Out of the 119 respondents in the text condition, 73 – or 61% - perceived the ethnicity of the witness in the scenario to be of NZE ethnicity. This finding suggests that participants are associating NZE ethnicity speakers as passive actors in the semantic context of crime. Although data was not obtained requesting respondents to guess the ethnicity of the perpetrator, a future qualitative analysis on the comments judging the witness' null response to the crime, alongside their ethnicity judgements may reveal some semantic associations between ethnicity and the field of justice.

8.3 Within-participant attitudinal priming

As noted, individual variation was a significant factor in reported levels of attitudes towards the Police, alongside their experience of Police contact. Although the effect of the mode of stimuli held across the groups, the extent of individual variation raises the question as to whether the effect would still hold if the study used a within-participant methodology. This would be difficult to achieve without alerting the respondents to the saliency of ethnicity but may be achievable with more speakers for each ethnicity. This would involve a factorial design whereby each ethnicity was represented by pro and anti-Police speakers and respondents would then be told they were going to hear the view of several New Zealanders. Like the present study, they would respond to whether they agreed or disagreed with each of the statements but would also be presented with text questions randomly ordered either before or after the audio conditions. However, such a design would require a much larger respondent sample than was able to be obtained for this thesis.

8.4 Further exploration on the link between ethnicity and voice activation

The MII ethnicity predictor in this study is arguably just one step in the direction of measuring ethnicity and trust in the Police. It provides an indication of the respondent's level of exposure to Māori culture, through social networks as well as individual participation in Māori related activities. The polynomial distribution of trust scores across the MII reinforces the complexity of evaluating Māori cultural affiliation and suggests potential for further investigation in line with Houkamau & Sibley's (2010) work on the self-esteem of people with Māori heritage who are not fully immersed with the culture. One option in this

direction would be to follow the work of Osborne et al., (2015), who adapted items from Leach et al. (2008) to create an “ethnic identity centrality” measure in order to assess whether neighbourhood inequality could predict one’s self-esteem and affiliation with their ethnic group (Osborne et al., 2015:371).

Within the context of this study, not only could the ethnic identity centrality measure used by Osborne et al. (2015) evaluate a respondent’s social positioning in accordance to the Māori ‘in-group’ but it could be contrasted with the level of alignment that New Zealand Europeans express towards their ‘in-group’. This was out of scope for this thesis, due to the aim of determining whether the effect of voice activation varied according to the strength of association between the stimuli and the target response, whereby the literature suggested that perception of Māori voice would be the most likely to trigger the association with distributional fairness. However, analysis from the intra-NZE group may be fruitful when moving towards an exploration on the potential motivation behind voice activation. It may be the case that those who identify more with a NZE identity (as opposed to a non-Māori identity) would be primed by a Māori voice to reveal lower levels of perceived fairness, owing to a larger feeling of in-group guilt (assuming they perceived the Police to be a predominately NZE institution), as work by Leach et al., (2008:162) would suggest. Conversely, they may reveal lower levels due to their need for a greater sense of within-group “collective security” (Sibley & Liu, 2007, p. 1235).

A more linguistic-focused exploration of ethnicity and voice priming would also be to identify respondents’ attitudes towards their perception of the relationship between ethnic identity and language. If strong views, in either direction, were expressed towards Te Reo Māori or the English associated with Māori speakers, one may expect the individual would be more susceptible to priming than those with weaker views. For example, for a person who indexes Māori identity, three statements from the MMM-ICE could be used:

- “I try to korero (speak) Māori whenever I can.”
- “You can be a true Māori without ever speaking Māori”.
- “I can’t do Māori culture or speak Māori.”

(Houkamau & Sibley, 2010, p. 17)

8.5 Speaker’ bias and the effect of ethnicity production in voice

Drager & Kirtley, (2016) argue that linguistic production is susceptible to social bias in the same way as linguistic perception, given that some level of sociolinguistic awareness is required in order to be socially meaningful (2016:9). This draws parallels with Croft’s (2009) Social Cognitive Linguistics framework’s notion of language as a cognitive process by which humans are “engaging in joint action” (Croft, 2009:398). The speaker and hearer are therefore joint actors in reinforcing the contextual meaning from linguistic cues and thus each speaker controls, at least to some extent, the content available for the listener to be verbally primed. This aspect of cognition theory was not able to be addressed using the

methodological approach of this study whereby the speakers and listeners were not engaging as joint actors in live discourse, as would likely be the case in Citizen Satisfaction telephone interviews. It currently remains to be seen, therefore, whether this discourse environment would in fact reveal voice priming at the perceived ethnicity level, rather than at the more generic mode of stimuli level found here.

However, the speakers in the context of the present experiment were still subjected to similar contextual features as the listeners (that is the speakers encountered new stimuli, albeit in written form) and therefore social meaning must have also been interpreted and reflected by the speakers in the production of the statements. The effect for this was controlled to the extent that speakers were instructed to read each statement in a neutral manner. However, the speakers were actively aware that they were recruited as representatives of their ethnic (and age/gender) demographics and furthermore, as humans, each speaker would have their own opinions on the statements that they were reading and thus may subconsciously alter their speech (or “frame” their conceptualisation, to use Croft's, (2009) terminology) accordingly. This could conceivably happen in two opposing ways, by aligning with their ethnic identity (i.e. the Māori speaker may use features that are ‘more Māori’ for statements unsupportive of the Police), or by distancing themselves from their ethnic identity by recognising their in-group bias and actively attempting to disguise it by reducing features associated with that group. Alternatively, they may have expressed general agreement or disagreement with the statement for example, by emphasising negations in some statements more than others. In hindsight, if the speakers themselves had answered the survey in the text only control condition, including the demographic questionnaire, it may have been possible to assess whether their opinion had notably affected their speech production in either of these ways.

Furthermore, if perceived ethnicity was found significant as a predictor of behaviour in the scenario test, whereby there may have been other acoustic and verbal cues of Māori English, as described in section 4.3 of the literature review, this may suggest linguistics has a more significant role in predicting voice activation by perceived ethnicity; it may reveal the importance of style showing effects are more likely to occur in less formal discourse. This would have substantial implications for the Citizen Satisfaction Survey, given that the interviewers do not just read from a set of statements but also have a wider script and expand upon questions as required, arguably leaving the listener open to more social bias than the present study. If a correlation was found between the speaker's opinion and ethnic identity and their speech production, this would have also implications for the recruitment of staff in the CSS surveys, suggesting that interviewers would need to be tested to have neutral opinions on the Police themselves, in order to reduce the potential for their particular voice to prime the respondents' reported opinions.

9 References

- Adida, C. L., Ferree, K. E., Posner, D. N., & Robinson, A. L. (2016). Who's asking? Interviewer coethnicity effects in African survey data. *Comparative Political Studies*, 49(12), 1630–1660.
- Alberton, A. M., & Gorey, K. M. (2018). Contact stronger predictor of attitudes toward police than race: a state-of-the-art review. *Policing: An International Journal of Police Strategies & Management*, (just-accepted), 00–00.
- Bargh, J. A., Chaiken, S., Govender, R., & Pratto, F. (1992). The generality of the automatic attitude activation effect. *Journal of Personality and Social Psychology*, 62(6), 893.
- Bates, D., Maechler, M., Bolker, B., Walker, S., Christensen, R. H. B., Singmann, H., ... Bolker, M. B. (2016). Package "lme4." In *R Package Version 1.1–10*. Retrieved from <http://kambing.ui.ac.id/cran/web/packages/lme4/lme4.pdf>
- Benor, S. B. (2010). Ethnolinguistic repertoire: Shifting the analytic focus in language and ethnicity. *Journal of Sociolinguistics*, 14(2), 159–183.
- Bradford, B., Jackson, J., & Stanko, E. A. (2009). Contact and confidence: revisiting the impact of public encounters with the police. *Policing and Society*, 19(1), 20–46.
<https://doi.org/10.1080/10439460802457594>
- Brown, P., & Levinson, S. C. (1989). *Politeness: Some universals in language usage* (Vol. 4). Cambridge University Press.
- Cao, L. (2014). Aboriginal People and Confidence in the Police. *Canadian Journal of Criminology and Criminal Justice*, 56(5), 499–526. <https://doi.org/10.3138/CJCCJ.2013.E05>
- Croft, W. (2009). Towards a social cognitive linguistics. In V. Evans & S. Pourcel (Eds.), *New Directions in Cognitive Linguistics* (pp. 395–420). John Benjamins Publishing Company.
- Cutler, A. (2010). *Random Forests for Regression and Classification*. Utah State University.
- Dasgupta, N., & Greenwald, A. G. (2001). On the malleability of automatic attitudes: combating automatic prejudice with images of admired and disliked individuals. *Journal of Personality and Social Psychology*, 81(5), 800.

- Davis, D. W., & Silver, B. D. (2003). Stereotype Threat and Race of Interviewer Effects in a Survey on Political Knowledge. *American Journal of Political Science*, 47(1), 33.
<https://doi.org/10.2307/3186091>
- De, Z. (2017). *Race, Gender, and/u: Social Perceptions of a Non-Stereotype Feature* (PhD Thesis). The Ohio State University.
- Drager, K. (2009). *A sociophonetic ethnography of Selwyn Girls' High*. University of Canterbury. Retrieved from
https://www.researchgate.net/profile/Katie_Drager/publication/45435406_A_Sociophonetic_Ethnography_of_Selwyn_Girls'_High/links/0c96053b32899d9eee000000.pdf
- Drager, K., & Kirtley, J. (2016). Awareness, salience, and stereotypes in exemplar-based models of speech production and perception. In M. Babel (Ed.), *Awareness and control in sociolinguistic research* (pp. 1–24).
- Eades, D. (2003). Lawyer-Client Communication “I don’t think the lawyers were communicating with me”: Misunderstanding cultural differences in communicative style. *EMORY LAW JOURNAL*, 52, 1110–1134.
- Field, A. P., Miles, J., & Field, Z. (2012). Exploratory factor analysis. In *Discovering statistics using R*. (pp. 749–811). London: Sage.
- Gaertner, S. L., & Dovidio, J. F. (1977). The subtlety of White racism, arousal, and helping behavior. *Journal of Personality and Social Psychology*, 35(10), 691.
- Giles, H. (1973). Accent Mobility: A Model and Some Data. *Anthropological Linguistics*, 15(2), 87–105.
- Giles, H., & Gasiorek, J. (2013). Parameters of non-accommodation: Refining and elaborating communication accommodation theory. In J. Forgas, J. László, & V. Orsolya (Eds.), *Social cognition and communication* (pp. 155–172). New York: Psychology Press.
- Gravitas. (2016). *New Zealand Police Citizens' Satisfaction Survey* (Research Report Prepared for New Zealand Police) (p. 197). Retrieved from
http://www.police.govt.nz/sites/default/files/publications/citizens_satisfaction_survey_full_report_-_2016.pdf

- Gravitas. (2017). *New Zealand Police Citizens' Satisfaction Survey* (Research Report Prepared for New Zealand Police) (p. 197). Retrieved from http://www.police.govt.nz/sites/default/files/publications/citizens_satisfaction_survey_full_report_-_2016.pdf
- Hatzidaki, A., Baus, C., & Costa, A. (2015). The way you say it, the way I feel it: emotional word processing in accented speech. *Frontiers in Psychology*, 6. <https://doi.org/10.3389/fpsyg.2015.00351>
- Hay, J., & Drager, K. (2010). Stuffed toys and speech perception. *Linguistics*, 48(4). <https://doi.org/10.1515/ling.2010.027>
- Hay, J., Nolan, A., & Drager, K. (2006). From fush to feesh: Exemplar priming in speech perception. *The Linguistic Review*, 23(3). <https://doi.org/10.1515/TLR.2006.014>
- Holmes, J. (1996). Losing voice: is final /z/ devoicing a feature of Maori English? *World Englishes*, 15(2), 193–205. <https://doi.org/10.1111/j.1467-971X.1996.tb00105.x>
- Holmes, K., Murachver, T., & Bayard, D. (2001). Accent, Appearance, and Ethnic Stereotypes in New Zealand. *New Zealand Journal of Psychology*, 30(2). Retrieved from <http://www.psychology.org.nz/wp-content/uploads/NZJP-Vol302-2001-5-Holmes.pdf>
- Hothorn, T., Buehlmann, P., Dudoit, S., Molinaro, A., & Van Der Lann, M. (2006). Survival Ensembles. *Biostatistics*, 7(3), 355–373.
- Houkamau, C. A., & Sibley, C. G. (2010). The multi-dimensional model of Māori identity and cultural engagement. *New Zealand Journal of Psychology*, 39(1), 8–28.
- Houkamau, C. A., & Sibley, C. G. (2015). The Revised Multidimensional Model of Māori Identity and Cultural Engagement (MMM-ICE2). *Social Indicators Research*, 122(1), 279–296. <https://doi.org/10.1007/s11205-014-0686-7>
- Huang, J. Y., Song, H., & Bargh, J. A. (2011). Smooth trajectories travel farther into the future: Perceptual fluency effects on prediction of trend continuation. *Journal of Experimental Social Psychology*, 47(2), 506–508. <https://doi.org/10.1016/j.jesp.2010.12.002>
- Jackson, J., & Bradford, B. (2010a). What is Trust and Confidence in the Police? *Policing*, 4(3), 241–248. <https://doi.org/10.1093/police/paq020>

- Jackson, J., & Bradford, B. (2010b). What is Trust and Confidence in the Police? *Policing*, 4(3), 241–248.
<https://doi.org/10.1093/police/paq020>
- Johnson, D., Wilson, D. B., Maguire, E. R., & Lowrey-Kinberg, B. V. (2017). Race and Perceptions of Police: Experimental Results on the Impact of Procedural (In)Justice. *Justice Quarterly*, 34(7), 1184–1212. <https://doi.org/10.1080/07418825.2017.1343862>
- King, J. (1995). Māori English as a solidarity marker for te reo Māori. *New Zealand Studies in Applied Linguistics*, 1, 51–59.
- Krosnick, J. A., Judd, C. M., & Wittenrink, B. (2014). The Measurement of Attitudes. In D. Albarracin, B. T. Johnson, & M. P. Zanna (Eds.), *The Handbook of Attitudes*. Psychology Press.
- Leach, C. W., van Zomeren, M., Zebel, S., Vliek, M. L. W., Pennekamp, S. F., Doosje, B., ... Spears, R. (2008). Group-level self-definition and self-investment: A hierarchical (multicomponent) model of in-group identification. *Journal of Personality and Social Psychology*, 95(1), 144–165.
<https://doi.org/10.1037/0022-3514.95.1.144>
- Levon, E. (2014). Categories, stereotypes, and the linguistic perception of sexuality. *Language in Society*, 43(05), 539–566. <https://doi.org/10.1017/S0047404514000554>
- Lowrey-Kinberg, B. V. (2018). Procedural justice, overaccommodation, and police authority and professionalism: results from a randomized experiment. *Police Practice and Research*, 19(2), 111–124. <https://doi.org/10.1080/15614263.2018.1418167>
- Lüdecke, D. (2018). Package “sjPlot” (Version 2.4.1). Retrieved from
<https://github.com/strengejacke/sjPlot>
- MacFarlane, A. E. (2014). *Voice activated: exploring the effects of voices on behaviour* (Doctor of Philosophy). University of Canterbury.
- MacFarlane, A. E., & Stuart-Smith, J. (2012). “One of them sounds sort of Glasgow Uni-ish”. Social judgements and fine phonetic variation in Glasgow. *Lingua*, 122(7), 764–778.
<https://doi.org/10.1016/j.lingua.2012.01.007>
- MacLagan, M., King, J., & Gillon, G. (2008). Maori English. *Clinical Linguistics & Phonetics*, 22(8), 658–670. <https://doi.org/10.1080/02699200802222271>

- MacLagan, M., King, J., Jones, I., & others. (2003). Devoiced final/z/in Maori English. *New Zealand English Journal*, 17, 17.
- Maguire, E. R., Lowrey, B. V., & Johnson, D. (2017). Evaluating the relative impact of positive and negative encounters with police: a randomized experiment. *Journal of Experimental Criminology*, 13(3), 367–391. <https://doi.org/10.1007/s11292-016-9276-9>
- Maxwell, G., & Smith, C. (1998). Police perceptions of Māori. *Wellington: Institute of Criminology, Victoria University of Wellington*.
- Murphy, K., & Cherney, A. (2011). Fostering cooperation with the police: How do ethnic minorities in Australia respond to procedural justice-based policing? *Australian & New Zealand Journal of Criminology*, 44(2), 235–257. <https://doi.org/10.1177/0004865811405260>
- Nairn, R. G., & McCreanor, T. (1991). Race talk and common sense: Patterns in Pakeha discourse on Maori/Pakeha relations in New Zealand. *Journal of Language and Social Psychology*, 10, 245–262.
- New Zealand Police. (2012). *The Turning of the Tide: A Whānau Ora Crime and Crash Prevention Strategy*. Retrieved from <http://www.police.govt.nz/sites/default/files/publications/the-turning-of-the-tide-strategy-2012-13-2017-18.pdf>
- New Zealand Police. (2017). *New Zealand Police Four Year Plan 2017-2021*. Retrieved from <http://www.police.govt.nz/about-us/publication/new-zealand-police-four-year-plan-2017-2021>
- New Zealand Police. (2018, August 6). Unique Offenders (demographics). Retrieved March 17, 2017, from <http://www.police.govt.nz/about-us/publications-statistics/data-and-statistics/policedatanz/unique-offenders-demographics>
- Niedzielski, N. (1999). The effect of social information on the perception of sociolinguistic variables. *Journal of Language and Social Psychology*, 18(1), 62–85.
- Nosek, B. A., Smyth, F. L., Hansen, J. J., Devos, T., Lindner, N. M., Ranganath, K. A., ... Banaji, M. R. (2007). Pervasiveness and correlates of implicit attitudes and stereotypes. *European Review of Social Psychology*, 18(1), 36–88. <https://doi.org/10.1080/10463280701489053>
- O'Brien-Olinger, S. (2016). *Police, Race and Culture in the "New Ireland": An Ethnography*. Basingstoke, Hampshire, England: Palgrave Macmillan.

- Osborne, D., Sibley, C. G., & Sengupta, N. K. (2015). Income and neighbourhood-level inequality predict self-esteem and ethnic identity centrality through individual- and group-based relative deprivation: A multilevel path analysis: Income and neighbourhood-level inequality. *European Journal of Social Psychology*, 45(3), 368–377. <https://doi.org/10.1002/ejsp.2087>
- Pantos, A. J. (2014). Defining the cognitive mechanisms underlying reactions to foreign accented speech: An experimental approach. In *Review of Cognitive Linguistics. Published under the auspices of the Spanish Cognitive Linguistics Association* (Vol. 10, pp. 427–453).
- Parahi, C. (2018, May 1). Police, politics and race: Long and anguished tale of constabulary's relationship with Māori. Retrieved from <https://www.stuff.co.nz/national/103137846/police-politics-and-race-the-long-and-anguished-tale-of-the-constabularys-relationship-with-maori>
- Peach, E. (2016). *The perception of ethnicity and hesitation on credibility in New Zealand court transcripts* (Unpublished thesis). University of Canterbury.
- Qualtrics Survey Software. (n.d.). Retrieved January 27, 2018, from www.qualtrics.com
- R Core Team. (2017). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical computing. Retrieved from <http://www.R-project.org>
- Rata, A., Liu, J. H., & Hanke, K. (2008). Te Ara Hohou Rongo (The Path to Peace) Maori Conceptualisations of Inter-group Forgiveness. *New Zealand Journal of Psychology*, 37(2).
- Reynolds, J. J., Estrada-Reynolds, V., & Nunez, N. (2018). Development and validation of the Attitudes Towards Police Legitimacy Scale. *Law and Human Behavior*, 42(2), 119–134. <https://doi.org/10.1037/lhb0000281>
- Robinson, J., & McArthur, L. Z. (1982). Impact of salient vocal qualities on causal attribution for a speaker's behavior. *Journal of Personality and Social Psychology*, 43(2), 236.
- Sibley, C. G., & Liu, J. H. (2007). New Zealand = bicultural? Implicit and explicit associations between ethnicity and nationhood in the New Zealand context. *European Journal of Social Psychology*, 37(6), 1222–1243. <https://doi.org/10.1002/ejsp.459>
- Sibley, C. G., & Osborne, D. (2016). Ideology and Post-Colonial Society: Ideology and Post-Colonial Society. *Political Psychology*, 37, 115–161. <https://doi.org/10.1111/pops.12323>

- Skogan, W. G. (2006). Asymmetry in the Impact of Encounters with Police. *Policing and Society*, 16(2), 99–126. <https://doi.org/10.1080/10439460600662098>
- Song, H., & Schwarz, N. (2008). Fluency and the detection of misleading questions: Low processing fluency attenuates the Moses illusion. *Social Cognition*, 26(6), 791–799.
- Statistics New Zealand. (2013). 2013 Census QuickStats about Māori. Retrieved April 24, 2017, from <http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-about-maori-english.aspx>
- Statistics New Zealand. (2014, April 15). 2013 Census QuickStats about culture and identity. Retrieved from <http://archive.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-culture-identity/maori.aspx>
- Statistics New Zealand. (2018). Ethnicity. Retrieved June 20, 2018, from <https://www.stats.govt.nz/topics/ethnicity>
- Strobl, C., Boulesteix, A.-L., Kneib, T., Augustin, T., & Zeileis, A. (2008). Conditional Variable Importance for Random Forests. *BMC Bioinformatics*, 9(1), 307. <https://doi.org/10.1186/1471-2105-9-307>
- Strobl, C., Boulesteix, A.-L., Zeileis, A., & Hothorn, T. (2007). Bias in Random Forest Variable Importance Measures: Illustrations, Sources and a Solution. *BMC Bioinformatics*, 8(25). Retrieved from <http://www.biomedcentral.com/1471-2105/8/25>.
- Strobl, C., Malley, J., & Tutz, G. (2009). An introduction to recursive partitioning: Rationale, application, and characteristics of classification and regression trees, bagging, and random forests. *Psychological Methods*, 14(4), 323–348. <https://doi.org/10.1037/a0016973>
- Szakay, A. (2007). *Identifying Maori English and Pakeha English from suprasegmental cues: a study based on speech resynthesis*. Retrieved from <https://ir.canterbury.ac.nz/handle/10092/975>
- Szakay, A., Babel, M., & King, J. (2012). Sociophonetic markers facilitate translation priming: Maori English GOAT—A different kind of animal. *University of Pennsylvania Working Papers in Linguistics*, 18(2), 16.
- Tagliamonte, S. A., & Baayen, R. H. (2012). Models, forests, and trees of York English: Was/were variation as a case study for statistical practice. *Language Variation and Change*, 24(02), 135–178. <https://doi.org/10.1017/S0954394512000129>

- Te Whaiti, P., & Roguski, M. (1998). Maori perceptions of the Police. Retrieved March 10, 2017, from <http://www.police.govt.nz/sites/default/files/publications/maori-perceptions-of-police.pdf>
- Thompson, M., & Kahn, K. B. (2016). Mental health, race, and police contact: intersections of risk and trust in the police. *Policing: An International Journal of Police Strategies & Management*, 39(4), 807–819. <https://doi.org/10.1108/PIJPSM-02-2016-0015>
- Tyler, T. R. (1987). Conditions leading to value-expressive effects in judgments of procedural justice: A test of four models. *Journal of Personality and Social Psychology*, 52(2), 333.
- Tyler, T. R. (2001). Public trust and confidence in legal authorities: What do majority and minority group members want from the law and legal institutions? *Behavioral Sciences & the Law*, 19(2), 215–235. <https://doi.org/10.1002/bsl.438>
- Tyler, T. R. (2005). Policing in Black and White: Ethnic Group Differences in Trust and Confidence in the Police. *Police Quarterly*, 8(3), 322–342. <https://doi.org/10.1177/1098611104271105>
- Tyler, T. R., & Blader, S. L. (2000). *Cooperation in groups: Procedural Justice, Social Identity, and Behavioural Engagement*. Philadelphia; Hove: Psychology Press.
- Watson, K., & Clark, L. (2015). Exploring listeners' real-time reactions to regional accents. *Language Awareness*, 24(1), 38–59. <https://doi.org/10.1080/09658416.2014.882346>
- Williams, M. T., Turkheimer, E., Magee, E., & Guterbock, T. (2008). The effects of race and racial priming on self-report of contamination anxiety. *Personality and Individual Differences*, 44(3), 746–757. <https://doi.org/10.1016/j.paid.2007.10.009>
- Wolfram, W., & Schilling, N. (2015). *American English: dialects and variation* (Vol. 25). John Wiley & Sons.

10 Appendices

10.1 Statistical Model Syntax for overall data

10.1.1 Overall Agreement

The following simple linear regression model (Table 5-6) was used for model, where “cleandata” relates to the data source and “agreement” is the response variable.

```
AGR.lm <- lm(agreement ~ MIItotal + StimuliGender*victimcrime, cleandata)
```

The variable importance plot (Figure 10.1-1) was constructed with the following Random Forest parameters:

```
AGR.forestP <- cforest(agreement ~ MIItotal + p_gender + ethnicityguesscomb + StimuliGender +  
friendliness + island + confidence + v_educationnum + mode + victimcrime + id + age + clarity +  
prefresearch, data=cleandata, controls = cforest_control(ntree = 200, mtry = 4))
```

10.1.2 Baseline Trust

Linear regression model:

```
BLT.LM <- lm(baselinetrust ~ policecontact + island + mode, cleandata)
```

Baseline Trust Random Forest

```
BLT.forest <- cforest(baselinetrust ~ p_gender + MIItotal + victimcrime + ethnicityguesscomb +  
StimuliGender + friendliness + island + clarity + confidence + v_educationnum + mode + prefresearch +  
age + id, data=cleandata, controls = cforest_control(ntree = 200, mtry = 3))
```

10.1.3 Baseline Fairness

```
BLF.LM <- lm(baselinefairness ~ policecontact + island + mode, cleandata)
```

Baseline Fairness Random Forest

```
BLF.forest <- cforest(baselinefairness ~ p_gender + MIItotal + victimcrime + ethnicityguesscomb +  
StimuliGender + friendliness + island + clarity + confidence + v_educationnum + mode + prefresearch +  
age + id, data=cleandata, controls = cforest_control(ntree = 200, mtry = 3))
```

10.1.4 Combined Trust

Linear regression model:

```
COT.forestlm <- lm(combinedtrust ~ relevel(policecontact, ref = "N")*MIItotal + mode + island, cleandata)
```

Combined Trust Random Forest:

```
COT.forest <- cforest(combinedtrust ~ p_gender + ethnicitycomb + victimcrime + ethnicityguesscomb +
StimuliGender + friendliness + island + clarity + confidence + v_educationnum + mode + prefresearch +
age + id, data=cleandata, controls = cforest_control(ntree = 200, mtry = 3))
```

10.1.5 Institutional Trust

Linear regression model:

```
INS.forestlm <- lm(RInstitutionalTrust ~ relevel(policecontact, ref = "N") + mode + island, cleandata)
```

Combined Trust Random Forest:

```
COT.forest <- cforest(combinedtrust ~ p_gender + ethnicitycomb + victimcrime + ethnicityguesscomb +
StimuliGender + friendliness + island + clarity + confidence + v_educationnum + mode + prefresearch +
age + id, data=cleandata, controls = cforest_control(ntree = 200, mtry = 3))
```

10.1.6 Motive-based Trust

```
MBT.forestlm <- lm(Rmotivetrust ~ relevel(policecontact, ref = "N") + mode, cleandata)
```

```
MBT.forest <- cforest(Rmotivetrust ~ p_gender + ethnicitycomb + victimcrime + ethnicityguesscomb +
StimuliGender + friendliness + island + clarity + confidence + v_educationnum + mode + prefresearch +
age + id, data=cleandata, controls = cforest_control(ntree = 200, mtry = 3))
```

10.1.7 Distributional fairness

```
DSF.forestlm <- lm(Rdisfair ~ relevel(policecontact, ref = "N") + mode + MIItotal, cleandata)
```

```
DSF.forest <- cforest(Rdisfair ~ p_gender + ethnicitycomb + victimcrime + ethnicityguesscomb +
StimuliGender + friendliness + island + clarity + confidence + v_educationnum + mode + prefresearch +
age + id, data=cleandata, controls = cforest_control(ntree = 200, mtry = 3))
```

10.2 Statements

The following provides a table of all statements and the final attitude measures they constituted (noting those with are reversed coded (R), along with Cronbach's alpha as a reliability measure for each at a 95% confidence interval. The statement factor loading for the PCA component is also included (whereby negative scores indicate reversed coding). Not all statements contributed to an attitude measure analysed within this thesis but were included in anticipation of future research avenues on attitudes such as Police performance and public feelings of safety.

ID	Statement	Source of Statement *	Motive-Based Trust	Institutional Based Trust	Combined Trust	Distributional Fairness	Fairness (PCA component)
S1	My last contact with the police was better than I expected.	CSS	N	N	N	N	N
S2	People are treated as individuals by the Police regardless of their race.	PPM	N	Y	Y	Y	0.66
S3	I was treated fairly during my last contact with the police.	CSS	Y	N	Y	N	N
S4	The police will treat offenders, not suspects, roughly if the offender treats them poorly. This is not a matter of race.	PPM	N	N	N	Y	0.67
S5	I am not confident I could find out who to call if I wished to make a complaint with the police.	CSS	N	N	N	N	N
S6	I generally expect poor service from the police.	CSS	N	Y	Y	N	N
S7	I have trust and confidence in the New Zealand Police.	CSS	N	N	N	N	N
S8	The Police are responsive to the needs of my community	CSS	Y	N	Y	Y	N
S9	I feel safe on the roads in my town during the day.	CSS	N	N	N	N	N
S10	Compared with 12 months ago, I would say my level of trust and confidence in the police has decreased	CSS	N	N	N	N	N
S11	I feel unsafe on the roads in my area after dark.	CSS	N	N	N	N	N
S12	The Police are not involved in activities in my community.	CSS	Y	N	Y	Y (R)	N
S13	Police are quick to pursue things they think might be useful to them, but they don't really listen.	MPP	Y	N	Y	N	N
S14	I would rather go to my lawyer where I've got more confidence.	MPP	N	N	N	N	N
S15	If you want to be more friendly towards Māori communities, you need to be giving responsibilities back to Māori to have control.	MPP	N	N	N	N	N
S16	Police do not recognize that their approach in many situations is inappropriate and offensive.	MPP	N	N	N	N	-0.47
S17	Some Police 'lean over backwards' to be fair and adopt a lighter approach to	PPM	N	N	N	N	N

	Māori communities than to majority groups.						
S18	Police have a recruiting culture which actually identifies people who are different and either modifies them to become them or gets rid of them.	MPP	N	Y	Y	Y (R)	-0.48
S19	In general, the likelihood of the Police investigating a crime reported by a member of the public of Māori descent or Caucasian decent is the same.	PPM		Y		Y	0.79
S20	Māori perception of the police must change before more Māori recruits can be found	PPM				N	N
Total number of statements			4	4	8	6	5
Cronbach's alpha							0.74

10.3 Speaker instructions

The following information was presented to the speakers before recording.

Thank you for taking the time to provide your voice to assist with this research project, your contribution is greatly appreciated.

This session will run in three parts and should take no more than half an hour. Firstly, we will ask you to tell a story in your own words with the help of some bullet points, then you will read a list of statements portraying various attitudes towards the police. We will then ask you to retell the story. Both the story and statements will be uploaded on an online survey, alongside those collected from the other speakers, which will be distributed across New Zealand.

Scenario Instructions

We would like you to tell a story like you would to a friend, telling them about your day. We would like the story to include the key points below but we're happy for you to add to it, using whatever words you like, to make it sound more natural. The most important points are in bold.

You are going to your local supermarket to do a shop that you do quite frequently after a long day at work.

You end up in the cosmetic/razor aisle, you then accidentally bump into someone who is bigger than you and clearly from a low socio-economic background – yet they have an expensive looking leather jacket

You feel a bit intimidated so you don't look at him directly but apologize for bumping into him

His response is friendly enough

But then you notice that he has some expensive razors stuffed inside his leather jacket pocket: there are other people around who have seen and aren't doing or saying anything

So you also decide to leave it, pay for your items and leave the supermarket.

Statement Instructions

The following statements should be read clearly - please stick to the script. You may take as many attempts as needed.

10.3.1 Respondent instructions: default page

Welcome, Nau mai - Thank you for agreeing to participate in this survey.

This survey is in two parts. In one part, you will hear a speaker read 20 statements expressing different opinions on the Police. Your task is to answer how much you agree or disagree with the statement. Each statement will look like this



- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree
- ☐ I find this statement offensive.

In the other part, you will also hear the person describe a crime that they have witnessed to an acquaintance. We will ask you about your opinion about their actions. We will then ask you to complete a brief demographic questionnaire.

Please make sure that the sound is enabled on your device and you have the volume set to a comfortable level. Then press the play button above and confirm whether you can hear the long test beep:

- ☐ Yes, I can hear the sound
- ☐ No, I can't hear the sound

10.3.2 Respondent instructions: Couldn't hear audio, assigned to text control

Instructions Page – participant cannot hear audio (reassigned to control group)

Survey on the opinion of New Zealand Police

You told us that you cannot hear the audio clip so the statements will now look like this (example only):

Police in my community deserve a pay rise.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree
- ☐ I find this statement offensive

You will also read the written version of a witness' description of a crime. We will ask you about your opinion about their actions.

10.3.3 Scenario transcripts

The following paragraphs relate to the speaker's interpretation of the semi-scripted scenario test, in comparison to the written scenario presented in the text only condition. Each speaker's narration is transcribed in accordance to the standard convention for representing spoken discourse where:

(.) – pause less than 1 second

– pause for one second

Text-only condition

So I was at the supermarket yesterday, just doing the usual bread and milk round that I seem to be doing every other day lately. It was a bit late and I was feeling knackered from a hard day's work. Anyway I remembered I needed a new razor and when I went to grab one from the shelf, I accidentally bumped into this guy. He was a big fella, I didn't want to cross him if you know what I mean and he looked pretty skint even though he had this fancy looking leather jacket on. I felt pretty intimidated so I didn't even look at him and said "sorry, man." He was nice enough about it and said "you're all good" so I moved on and that's when I saw he had three or four flash razors in his inside jacket pocket. I wasn't the only one who saw though, since others saw me gawping at him. So I thought it'll be ok, no harm done there. Then I bought my razor and went home.

NZE Female

Um yeah so the other day after work I went to the supermarket um doing my usual weekly shop (.) busy day I was (.) in a rush down the cosmetics aisle just looking for the shampoo (.) and I accidentally bumped into this huge guy (.) you know typical me (.) one of the first things I noticed was oh that's a nice (.) expensive looking leather jacket (.) and then I (.) got a good look at him and (.) you know thought oh gosh he looks a bit (.) rough it doesn't really (.) match up (.) he had a (.) strange vibe (.) from him. Um I said sorry obviously but (.) he seemed friendly enough (.) he wasn't too bothered by it (.) but then I noticed he had some expensive razors stuffed inside the jacket pocket (.) I could tell other people around had (.) seen the same thing but nobody else was (.) doing or saying anything (.) so uh I thought about it a bit but (.) you know he was pretty intimidating (.) looking guy so decided just to (.) leave it at that and went and paid for my things and left.

Māori Female

Um (.) so after a long day at work went to the supermarket um (.) had to go to the cosmetic aisle because I needed some stuff from there (.) yeah that's always fun um and I accidentally bumped into this um (.) this giant looking beast of a man cause he was hori (.) um and (.) he had this really really expensive looking jacket on which made me wonder about him and what he does (.) um (.) I got a bit intimidated by him I avoided eye contact and apologized um but he was really lovely about it but then (.) I noticed that he had some expensive razors stuffed inside his leather jacket pocket (.) um there were other people around who

had seen the same (.) who had seen the same thing and didn't say anything (.) ah so I just decided to leave it as well and pay for my stuff and go.

Māori Male

Yeah bro so (.) went down to the supermarket (.) and I had to go and grab some stuff (.) er after mahi (1) had been a (.) long day (.) err and I ended up (1) err (.) trying to find some razors (1) and I bumped into someone (.) accidentally and he was a HUGE fella too (.) er (2.3) and (.) had this awesome er (.) leather jacket (1.1) I noticed it and thought oh (1) that's pretty cool but when he was looking at me I felt a little bit you know I felt a little bit intimidated er so I didn't even make eye contact with the fella but I said sorry (.) my bad and uh yeah nah he was all good about it (1.8) but then I noticed um (1.6) he had some razors stuffed in his jacket (1.6) heaps of people around (.) er (.) who might have seen it (1.4) er (.) but they ain't saying anything (1.9) so what do I do (.) nothing (1.3) paid for my stuff (.) and went home

Pakeha Male

Um so I stopped at the supermarket on my way home from work er just to grab some stuff er I was in the (.) er toiletries aisle (.) where I got um I was getting shampoo (.) I straight up bumped into this guy (.) this giant giant guy (.) um he looked pretty rough (.) immediately thought oh man I really shouldn't have done that (.) I I turned around (.) looked saw his fancy jacket (.) nice leather jacket (.) I said I'm really really sorry I didn't mean to do that (.) er didn't look at him (.) he was like oh nah it's all good don't worry about it (.) and as I walked past I noticed he had a bunch of really expensive razors stuffed inside his jacket pocket (1) um I looked I looked around to see that other people in the aisle and no one (.) no one was doing anything (.) so I was like nah I'm not gonna say anything to this guy (.) so I just went up (.) paid for my items and I just left

10.3.4 Scenario questions for all conditions

1. **Why do you think the witness didn't report the crime?**
Please answer in one or two sentences – there are no right or wrong answers.

2. **How right was this witness in not reporting this crime?**
Please answer in one or two sentences – there are no right or wrong answers.

3. How likely would you be to **report** this crime to a member of staff (knowing they would report to the Police)
☐ Certainly
☐ Probably
☐ Maybe, or maybe not
☐ Probably not
☐ Certainly not
4. How likely would you be to **report** this crime to a member of staff (knowing they would report to the Police) **if, rather than stealing the razors**, the perpetrator purposely bumped into another guy and stole his wallet?
☐ Certainly
☐ Probably
☐ Maybe, or maybe not
☐ Probably not
☐ Certainly not
5. How likely would you be to report the wallet theft to a member of staff (knowing they would report to the Police) **if** you had recognized the perpetrator from an extended family gathering a few years back?
☐ Certainly
☐ Probably
☐ Maybe, or maybe not
☐ Probably not
☐ Certainly not
6. How likely would you be to report the **razor theft** to a member of staff (knowing they would report to the Police) **if** you had recognized the perpetrator from an extended family gathering a few years back?
☐ Certainly
☐ Probably
☐ Maybe, or maybe not
☐ Probably not
☐ Certainly not

Additional Questions for participants in the text condition

Imagine you overheard the speaker telling the above story to an acquaintance. Please rate this imagined voice for the below qualities. Note there is no right or wrong answer, we are just looking for your personal opinion.

1. How friendly does the speaker sound?

- ☐ Very friendly
- ☐ Friendly
- ☐ Neither friendly nor unfriendly
- ☐ Unfriendly
- ☐ Very unfriendly

2. How educated do you think the speaker sounds?

- ☐ Post-graduate university level or similar
- ☐ University degree or similar trade qualification
- ☐ Post-school qualification
- ☐ Completed secondary school
- ☐ No formal education
- ☐ Unsure

3. How confident do you think the speaker sounds?

- ☐ Very confident
- ☐ Confident
- ☐ Neither confident nor unconfident
- ☐ Unconfident
- ☐ Very unconfident

4. What sex would you mostly imagine this speaker to be?

- ☐ Male
- ☐ Female

Additional Questions for participants in the Voice condition

Please rate the voice for the below qualities. Note there is no right or wrong answer, we are just looking for your personal opinion.

1. How clear did you find the speaker in general?

- ☐ Very clear
- ☐ Clear
- ☐ Indifferent
- ☐ Unclear
- ☐ Very unclear

2. How friendly does the speaker sound?

- ☐ Very friendly
- ☐ Friendly
- ☐ Neither friendly nor unfriendly
- ☐ Unfriendly
- ☐ Very unfriendly

3. How educated do you think the speaker sounds?

- ☐ Post-graduate university level or similar
- ☐ University degree or similar trade qualification
- ☐ Post-school qualification
- ☐ Completed secondary school
- ☐ No formal education
- ☐ Unsure

4. How confident do you think the speaker sounds?

- ☐ Very confident
- ☐ Confident
- ☐ Neither confident nor unconfident
- ☐ Unconfident
- ☐ Very unconfident

10.3.5 Respondent recruitment

Participants were recruited via the use of Facebook and through email contacts, as per below:

Facebook post:

Kia ora,

My name is Chloe, and I'm a Master of Linguistics student at the University of Canterbury in Christchurch, I am interested in the New Zealand public's opinion towards the Police. Agencies poll the public each year by telephone interviews; I would like to invite New Zealand residents, aged 18 and over, to take part

in my survey to test whether these polls are asking the right questions, to the right people. Your involvement in this project will involve rating how much you agree or disagree with a number of statements on opinions towards the Police.

Your contribution should take no longer than fifteen minutes and will help us better understand the relationship between the Police and the public.

To take part in this survey, please click [insert hyperlink to study: here]

If you, or anyone you know would be keen to find out more, please message me here on Facebook, or email me on chloe.hobbs@pg.canterbury.ac.nz for more information.

Email:

Kia ora,

My name is Chloe, and I'm a Master of Linguistics student at the University of Canterbury and I am interested in the New Zealand Public's opinion towards the Police. Agencies poll the public each year by telephone interviews - I would like to invite New Zealand residents, aged 18 and over, to take part in my survey to test whether these polls are asking the right questions, to the right people.

Your involvement in this project will involve rating how much you agree or disagree with a number of statements on opinions towards the Police and judging how right or wrong you believe a witness was to not report a crime.

Your contribution should take no longer than fifteen minutes. Please note this study is not being carried out by, for or with the Police or their representatives. However, it will help us better understand the relationship between the Police and the public.

To take part in this survey, please click [here](#).

Please feel free to forward this e-mail to anyone you know who is eligible and would be interested in participating in this survey. I am looking for a wide demographic of participants who live in Aotearoa.

If you have any questions please feel free to contact the researcher Chloe Hobbs (chloe.hobbs@canterbury.ac.nz) or supervisor Dr. Vica Papp (viktoria.papp@canterbury.ac.nz).

I appreciate your time in reading this email.

10.3.6 Respondent information sheet



Survey on the opinion of New Zealand Police: Information page

Thank you for your interest in participating with this online survey. This project is being conducted by Chloe Hobbs, a Masters' student under the supervision of Dr Viktoria Papp at the University of Canterbury.

The New Zealand Police annually polls the public on their opinion about the Police services they received. In this study we are looking at whether they are asking the right questions, to the right people and whether the phone versus online survey format give different results. Your answers will help us better understand the relationship between the Police and the public.

Your involvement in this project will first involve answering some questions about yourself and completing a questionnaire by indicating how much you agree or disagree with a number of statements. Then you will judge how right or wrong you believe a fictional witness was to not report a crime. This should take no longer than 15 minutes in total. We recommend using Firefox or Chrome browsers and ask that you complete the study in a quiet, non-distracting place because you may need to play audio clips.

The topic of this survey may be sensitive in nature, particularly if you or a family member have had negative experiences with the Police. This survey will not ask about your personal experiences, but some statements may trigger unpleasant memories. At the end of this study, links to support services will be provided. Your participation in this study is voluntary and you have the right to withdraw at any stage without penalty – to do this simply close the window and do not click submit. Additionally, you will also have the option to flag questions as offensive.

Please note this study is not being carried out by, for or with the Police or their representatives. The results of the project may be published and shared with the Police Research and Evaluation department, but you may be assured of the complete confidentiality and anonymity of all data, including any comments you provide. The researcher and the supervisor will not be able to identify you from the information you provide and your computer IP address will not be collected. The only question we will ask on your location is whether you are in the North or South island. Only the researcher and supervisor will have access to your anonymous answers from the server. All data will be destroyed after 5 years.

You will be provided with options to obtain the results of this study, at the end of the survey.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee (HEC 2017/25), and participants should address any complaints to The Chair, Human Ethics Committee,

University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz). The supervisor of this project can be contacted at viktoria.papp@canterbury.ac.nz. They will be pleased to discuss any questions or concerns you may have about participating in this research.

If you agree to participate in the study, please proceed to the next page to complete the consent acknowledgment.

10.3.7 Respondent consent form



Survey on the opinion of New Zealand Police

Consent form

I have read and understood the description of the above-named project and have had the opportunity to ask questions

I understand that once the online survey is live with my data, it will not be possible to remove my data from the study and the data will belong to the University of Canterbury.

I understand that any information or opinions I provide will be kept confidential to the researcher and supervisor and I consent to publication of the results of the project with the understanding that my spoken data is anonymized.

I understand that all data collected for the study will be kept in password protected electronic form. I understand any identifiable information such as the consent form will be kept in a secure facility. All data will be destroyed after 5 years.

I understand the risks associated with taking part and how they will be managed.

I understand that I can contact the researcher (*Chloe Hobbs* – chloe.hobbs@pg.canterbury.ac.nz) or supervisor (*Dr Viktoria Papp* – viktoria.papp@canterbury.ac.nz) for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

By signing below, I agree to assist in this research project

Name:

Signature:

X

Date:

10.3.8 Respondent debrief

Thank you for the time you've taken to participate in this research.

Please read the below information before closing this window:

The reason for not explaining this intention at the start of the study was to avoid drawing your attention to ethnicity because the research involves understanding behaviour at a more sub-conscious level. It is also more realistic of discrimination, which often occurs when people make judgements without often knowing the ethnicity of a speaker.

Please be assured, however that the detail on the Information page, relating to data handling and future intentions, remains true and correct – all information remains confidential and anonymous so it is not possible for you to be personally identified from this research.

We recognise that Māori and Pākehā are not binary ethnicities. We also understand that is a person's ethnic identity depends upon their individual beliefs and circumstances as well as the communities in which they belong and this may have more of an effect on the results rather than the label you primarily identify with. This is why we asked questions about how you interact with Māori and other communities.

Why this topic?

If the voice of a speaker can be shown to influence attitudes towards ethnicities, and is independent from what is being said, this has significant implications for a bicultural society such as New Zealand. Particularly where one institution, such as the Police, is responsible for providing an equal level of service to all communities. This study can provide insight into whether or not recent efforts between New Zealand Police and Maori communities are successfully changing common attitudes that crime is ingrained in Māori culture. Once we know the extent of sub-conscious discrimination, as a country, we can take more informed steps to reduce it.

How do I withdraw from this study?

After reading this information, if you no longer wish for the data you have provided to be used, you may withdraw from this study without penalty. To do this, please tick the box below and click "Submit." Your survey answers will then be discarded.

Please note, if you do not click this box and press submit, it will be assumed that you still give consent for your survey data to be used in this study.

☐

I wish for my survey answers to be removed from this study.

Can I see the results?

Once analysed, I will publish our findings on my online blog [[insert link here](#)] and via an email newsletter [[insert link "please subscribe here"](#)]. Please also feel free to email me directly (chloe.hobbs@pg.canterbury.ac.nz) or Dr Vica Papp, the supervisor of this project (viktoria.papp@canterbury.ac.nz) for further information. I will also be engaging with Māori representatives who we are indebted to for making this study possible in the first place.

Participant Support

We recognise that the content of this study may have caused some distress, particularly if you identify as Māori and feel that you have had negative experiences with the Police. We encourage you to seek support from a kaupapa Māori service. A nationwide directory of providers can be found on the Ministry of Health's website [here](#). You may also wish to talk with your local Iwi Liaison Police Officer, contact details can be found [here](#).

Anyone may have experienced negative relations with the Police, details on raising a complaint to them can be found [here](#).

Should you have a complaint regarding the nature of this study, these can be directed to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch

(human-ethics@canterbury.ac.nz).

Can I provide further anonymous comments?

Further comments on this topic or this survey in particular are welcome. To do this, please answer the questions below and press submit (if you do not have further comments, your responses have been saved and you may close this window): .

Do you have any further comments to add about your opinion of the police?

[free-text box]

Do you have any comments on how you found this survey?

[free-text box]

10.3.9 Demographic Questionnaire

Please tell us a little bit about yourself.

(1) Have you had any contact with the Police in the last year?

- ☐ None
- ☐ Yes, and I was satisfied
- ☐ Yes, and I was dissatisfied

(2) Have you been a victim of a crime within the last year?

- ☐ No
- ☐ Yes

(3) What is your current gender identity?

- ☐ Male/ Tāne
- ☐ Female/ Wahine
- ☐ Gender diverse/ Ira tāngata kōwhiri kore

(4) Please select your age from the drop down menu

- ☐ 18-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-59
- ☐ 60+

(5) Which New Zealand Island do you reside in or live closest to (if you are on a smaller island)?

- ☐ North Island
- ☐ South Island

(6) Which ethnic group do you belong to? Check the box or boxes which apply to you

- ☐ New Zealander of European Descent
- ☐ Māori
- ☐ Pasifika
- ☐ New Zealander of Asian Descent
- ☐ Other

(7) If you have a partner, their ethnicity is (check the box or boxes which apply to them)

- ☐ New Zealander of European Descent
- ☐ Māori
- ☐ Pasifika
- ☐ New Zealander of Asian Descent
- ☐ Other

(8) How well do you speak Te Reo Māori?

- ☐ 0: None
- ☐ 1: Basic
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5: Fluent

(9) How often do you listen to Māori radio stations? (eg. Tahu FM?)

- ☐ Never
- ☐ Sometimes
- ☐ Often

(10) How often do you watch The Māori Television or other Māori TV programmes?

- ☐ Never
- ☐ Sometimes
- ☐ Often

(11) Do you ever visit a marae?

- ☐ Never
- ☐ Sometimes
- ☐ Often

(12) People you spend most of your time with (friends, colleagues etc...) are :

- ☐ New Zealander of European Descent
- ☐ Māori
- ☐ Pasifika
- ☐ New Zealander of Asian Descent
- ☐ Other

(13) In general, to what extent do you perceive yourself to have been exposed to Māori English (not Te Reo Māori)?

- ☐ Never
- ☐ Seldom
- ☐ Sometimes
- ☐ Often

(14) What is your highest level of education?

- ☐ Post-graduate university level or similar
- ☐ University degree or similar trade qualification
- ☐ Post-school qualification
- ☐ Completed secondary school
- ☐ No formal education
- ☐ Unsure

(15) Which is your preferred method to participate in research?

- ☐ Online survey
- ☐ Telephone interview
- ☐ Face-to-face interview
- ☐ Other

10.3.10 Māori Integration Index – Matrix Adapted from (Szakay, 2007)

The top row of this matrix represents the total points that a respondent can score for each answer to the questions within the first column, depending upon their ethnicity. For example, if the participant's ethnicity is solely Maori, they receive 2 points.

Factor and conditions	Answers required to obtain below number of points								Highest score	Highest Maori	Highest Mixed	Highest Pakeha/
	0	0.5	1	1.5	2	2.5	3	3.5				
Participant_ethnicity	Participant_ethnicity									0	0	0
If Participant_ethnicity = ONLY Maori	New Zealander of European descent, Pasifika, Other	na	na	na	Maori	na	na	na	2	2	0	0
If Participant_ethnicity = CONTAINS Maori	New Zealander of European descent, Pasifika, Other	na	(CONTAINS) Maori	na	na	na	na	na	1	0	1	0
If Participant_ethnicity = ONLY New Zealander of European descent, Pasifika, Other	New Zealander of European descent, Pasifika, Other	na	na	na	na	na	na	na	0	0	0	0
Participant_partner_ethnicity	Participant_partner_ethnicity									0	0	0
If Participant_ethnicity = Maori	New Zealander of European descent, Pasifika, Other	na	(CONTAINS) Maori	ONLY Maori	na	na	na	na	1.5	1.5	0	0
If Participant_ethnicity = CONTAINS Maori	New Zealander of European descent, Pasifika, Other	na	na	(CONTAINS) Maori	ONLY Maori	na	na	na	2	0	2	0
If Participant_ethnicity = New Zealander of European descent, Pasifika, Other	New Zealander of European descent, Pasifika, Other	na	na	na	(CONTAINS) Maori	ONLY Maori	nz	na	2.5	0	0	2.5
Participant_social_circle_ethnicity	Participant_social_circle_ethnicity									0	0	0
If Participant_ethnicity = Maori	New Zealander of European descent, Pasifika, Other	na	na	(CONTAINS) Maori	ONLY Maori	na	na	na	2	2	0	0
If Participant_ethnicity = CONTAINS Maori	New Zealander of European descent, Pasifika, Other	na	na	na	(CONTAINS) Maori	ONLY Maori	na	na	2.5	0	2.5	0
If Participant_ethnicity = New Zealander of European descent, Pasifika, Other	New Zealander of European descent, Pasifika, Other	na	na	na	na	(CONTAINS) Maori	ONLY Maori	na	3	0	0	3
Participant_te_reo	Participant_te_reo									0	0	0
If Participant_ethnicity = Maori	0 (none)	1 (Basic)	2	3	4 (fluent)	na	na	na	2.5	2.5	0	0
If Participant_ethnicity = CONTAINS Maori	0 (none)	1 (Basic)	2	3	4 (fluent)	na	na	na	3	0	3	0
If Participant_ethnicity = New Zealander of European descent, Pasifika, Other	0 (none)	1 (Basic)	2	3	4 (fluent)	na	na	na	3.5	0	0	3.5
Participant_maori_radio_exposure	Participant_maori_radio_exposure									0	0	0
If Participant_ethnicity = Maori	0 (never)	na	1 (sometimes)	na	2 (often)	na	na	na	2	2	0	0
If Participant_ethnicity = CONTAINS Maori	0 (never)	na	na	1 (sometimes)	na	2 (often)	na	na	2.5	0	2.5	0
If Participant_ethnicity = New Zealander of European descent, Pasifika, Other	0 (never)	na	na	na	1 (sometimes)	na	2 (often)	na	3	0	0	3
Participant_maori_tv_exposure	Participant_maori_tv_exposure									0	0	0
If Participant_ethnicity = Maori	0 (never)	na	1 (sometimes)	na	2 (often)	na	na	na	2	2	0	0
If Participant_ethnicity = CONTAINS Maori	0 (never)	na	na	1 (sometimes)	na	2 (often)	na	na	2.5	0	2.5	0
If Participant_ethnicity = New Zealander of European descent, Pasifika, Other	0 (never)	na	na	na	1 (sometimes)	na	2 (often)	na	3	0	0	3

Participant_ME_exposure				Participant_ME_exposure						0	0	0
If Participant_ethnicity = Maori	0 (never), seldom	na	1 (sometimes)	na	2 (often)	na	na	na	2	2	0	0
	Statements 9 and 11 were found to correlate only with each other, negatively at a score of -0.43 which is unsurprising given that they relate to respondents' feelings of personal safety, with statement 11 being reversed scored. Whilst not suitable for PCA, this suggests a somewhat reliable attitudinal outcome measure of	na										
If Participant_ethnicity = CONTAINS Maori		na	0	1 (sometimes)	na	2 (often)	na	na	2.5	0	2.5	0
If Participant_ethnicity = New Zealander of European descent, Pasifika, Other	Should I apply alpha analysis here?	na	0	0	1 (sometimes)	na	2 (often)	na	3	0	0	3
Highest score by ethnicity										16	18.5	21
When a participant has not answered a question (shown as -99), award them 0 points towards their MII												